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NORTH CAROLINA AGRICULTURAL AND TECHNICAL
STATE UNIVERSITY
GREENSBORO
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EDWARD B. FORT
Chancellor

TO: STUDENT AND PROSPECTIVE STUDENTS

North Carolina Agricultural and Technical State University is a unique comprehensive state-supported University. It is the only comprehensive University in the State which has both a College of Engineering and a School of Agriculture-in consonance with its land-grant tradition, Schools of Business and Economics, Education and Nursing, and a College of Arts and Sciences. In addition, outstanding program offerings are provided in the Graduate School which continues with its nationally known uniqueness. Additionally, the School of Technology places emphasis upon programs designed to accommodate the University's Hi-Tech Mode. Consequently, matriculating students are provided unique and varied programmatic offerings.

The University has a distinguished faculty-one committed to superiority in teaching, research and public services. Moreover, its Alumni Association is one of the most active and productive alumni organizations in the State and Nation. Its support for the University and its mission has been exemplary.

This edition of the Undergraduate Bulletin provides specific information you will need to know about the University. However, as a world-class institution of higher learning with its rich tradition dating back to its chartering in 1891, North Carolina Agricultural and Technical State University can best be described as one committed to excellence. We-the Institution-would be a barren place without its adherence to that thesis, and that of course, is what contributes to its' heritage and tradition. It is depicted in the lives of both the Institution's Torchbearers as well as the outstanding men and women who left the University their legacy. The heritage and traditions of the University are evident in every facet of University life and when combined with the quality of our faculty, the campus commitment to excellence and the soundness of our mission related programs, one readily discerns the greatness of the campus.

I commend this spirit, these programs and this University to all students and prospective students.

Sincerely,
Edward B. Fort
Chancellor

An Equal Opportunity/Affirmative Action Employer
A Constituent Institution of THE UNIVERSITY OF NORTH CAROLINA

Bulletin
of
NORTH CAROLINA
AGRICULTURAL AND TECHNICAL
STATE UNIVERSITY
GREENSBORO, NORTH CAROLINA
UNDERGRADUATE PROGRAMS
1995-97



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NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

1995-96 UNIVERSITY ACADEMIC CALENDAR

FALL SEMESTER 1995

August 10-Thursday	Administrators' Conference
August 11-Friday	Faculty Meeting/Faculty-Staff Institute
August 13-Sunday	Freshman students report
August 14-15/Mon.-Tues.	Orientation and Advisement of freshmen and transfer students
August 15-Tuesday	Transfer students report
August 16-Wednesday	Registration for new freshman, transfer, readmitted and new graduate students
August 17-19/Thur.-Sat.	LATE REGISTRATION FOR CONTINUING STUDENTS
August 21-Monday	CLASSES BEGIN
August 25-Friday	LAST DAY TO ADD or AUDIT A COURSE
September 4-Monday	UNIVERSITY HOLIDAY (Labor Day)
September 5-Tuesday	LAST DAY TO DROP and RECEIVE FINANCIAL CREDIT
	LATE REGISTRATION ENDS (CENSUS DATE)
	LAST DAY TO APPLY FOR FALL GRADUATION
September 21-Thursday	Grade Evaluation for Student Athletes
October 4-Wednesday	FOUNDER'S DAY
October 7-Saturday	HOMECOMING
October 9-Monday	Deadline to remove incompletes received Spring and Summer 1995
October 13-Friday	Mid-term grades due for freshmen and athletes
October 14-17/Sat.-Tues.	FALL BREAK
October 27-Friday	LAST DAY TO DROP A COURSE WITHOUT GRADE EVALUATION
October 31-Tuesday	Deadline for international student applications admitted Spring semester
November 6-10/Mon.-Fri.	Early Registration Advisement
November 11-Saturday	UNIVERSITY DAY
November 13-15/Mon.-Wed.	Early Registration for Spring semester 1996
November 17-Friday	LAST DAY TO WITHDRAW FROM THE UNIVERSITY WITHOUT GRADE EVALUATION
November 20-Monday	Grade Evaluation for Student Athletes
November 22-Wednesday	THANKSGIVING HOLIDAYS begin at 1:00 p.m.
November 27-Monday	THANKSGIVING HOLIDAYS end at 7:00 a.m.
December 6-Wednesday	Applications for Spring semester admission to the University
	CLASSES END
December 7-Thursday	READING DAY
December 8-15/Fri.-Fri.	FINAL EXAMS
December 15-Friday	Fall semester ends
December 18-Monday	Grades due in the Office of the Registrar by 3:00 p.m.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

1995-96 UNIVERSITY ACADEMIC CALENDAR

SPRING SEMESTER 1996

January 3-Wednesday	Faculty report
January 4-Thursday	Freshman and transfer Residence halls open
January 4-5/Thurs.-Fri.	Orientation and Advisement for freshman and transfer students
January 5-6/Fri.-Sat.	Registration for new freshman and transfer students
	LATE REGISTRATION FOR CONTINUING STUDENTS
January 8-Monday	CLASSES BEGIN
January 12-Friday	LATE REGISTRATION ENDS (CENSUS DATE)
	LAST DAY TO ADD A COURSE
	LAST DAY TO DROP A COURSE and RECEIVE FINANCIAL CREDIT
	LAST DAY TO AUDIT A COURSE
January 15-Monday	UNIVERSITY HOLIDAY (Martin L. King, Jr.'s Birthday)
January 17-Wednesday	Last day to apply for Spring Graduation
January 29-Monday	Ronald E. McNair Memorial Day (classes are not canceled)
February 9-Friday	Grade Evaluation for Student Athletes
February 19-Monday	Deadline to remove incompletes received Fall 1995
February 26-Monday	Mid-term grades due for freshmen and athletes
March 2-Saturday	SPRING BREAK begins at 12:00 (NOON)
March 11-Monday	SPRING BREAK ends at 7:00 a.m.
March 15-Friday	LAST DAY TO DROP A COURSE WITHOUT GRADE EVALUATION
March 20-Wednesday	Spring semester Convocation
March 25-29/Mon.-Fri.	REGISTRATION ADVISEMENT
April 1-3/Mon.-Fri.	EARLY REGISTRATION for Fall 1996
April 5-Friday	UNIVERSITY HOLIDAY (Good Friday)
April 8-Monday	LAST DAY TO WITHDRAW FROM THE UNIVERSITY WITHOUT GRADE EVALUATION
	Third Grade Evaluation for Student Athletes
April 25-Thursday	CLASSES END
April 26-Friday	Reading Day
April 27-May 3/Sat.-Fri.	FINAL EXAMS
May 4-Saturday	Grades due in the Office of the Registrar by 2:00 p.m.
May 8-Wednesday	Graduation letters for Seniors, 2:00 p.m.
May 11-Saturday	COMMENCEMENT

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

PROPOSED 1996-97 UNIVERSITY ACADEMIC CALENDAR

FALL SEMESTER 1996

August 15-Thursday	Administrator's Conference
August 16-Friday	Faculty Meeting/Faculty Staff Institute
August 18-Sunday	Freshman students report
August 19-20/Mon.-Tues.	Orientation and Advisement of freshman and transfer students
August 20-Tuesday	Transfer students report
August 21-Wednesday	Registration for new freshman, transfer, readmitted and new graduate students
August 22-24/Thurs.-Sat.	LATE REGISTRATION FOR CONTINUING STUDENTS
August 26-Monday	CLASSES BEGIN
August 30-Friday	LAST DAY TO ADD or AUDIT A COURSE
September 2-Monday	UNIVERSITY HOLIDAY (Labor Day)
September 6-Friday	LAST DAY TO DROP and RECEIVE FINANCIAL CREDIT
	LATE REGISTRATION ENDS (CENSUS DATE)
	LAST DAY TO APPLY FOR FALL GRADUATION
September 30-Monday	Grade Evaluation for Student Athletes
October 4-Wednesday	FOUNDER'S DAY
October	HOMECOMING
October 7-Friday	Deadline to remove incompletes received Spring and Summer 1995
October 11-Friday	Mid-term grades due for freshmen and student athletes
October 19-22/Sat.-Tues.	FALL BREAK
October 25-Friday	LAST DAY TO DROP A COURSE WITHOUT GRADE EVALUATION
October 29-Tuesday	Deadline for international students applications admitted Spring semester
November 4-8/Mon.-Fri.	EARLY REGISTRATION ADVISEMENT UNIVERSITY DAY
Nov. 11-13/Mon.-Wed.	Early Registration for Spring semester 1997
November 15-Friday	LAST DAY TO WITHDRAW FROM THE UNIVERSITY WITHOUT GRADE EVALUATION
November 18-Monday	Grade Evaluation for Student Athletes
November 22-Wednesday	THANKSGIVING HOLIDAYS begin at 1:00 p.m.
December 2-Monday	THANKSGIVING HOLIDAYS end at 7:00 a.m.
December 4-Wednesday	Applications for Spring semester admission to the University
December 10-Tuesday	CLASSES END
December 11-Wednesday	READING DAY
Dec. 12-19/Thur.-Thur.	FINAL EXAMS
December 19-Thursday	Fall semester ends
December 20-Friday	Grades due in the Office of the Registrar by 3:00 p.m.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

PROPOSED 1996-97 UNIVERSITY ACADEMIC CALENDAR

SPRING SEMESTER 1997

January 8-Wednesday	Faculty report
January 9-Thursday	Freshman and transfer students report
January 9-10/Thurs.-Fri.	Orientation and Advisement for freshman and transfer students
January 10-11/Fri.-Sat.	Registration for new freshman and transfer students
	LATE REGISTRATION FOR CONTINUING STUDENTS
January 13-Monday	CLASSES BEGIN
January 17-Friday	LATE REGISTRATION ENDS (CENSUS DATE)
	LAST DAY TO ADD OR AUDIT A COURSE
	LAST DAY TO DROP A COURSE and RECEIVE FINANCIAL CREDIT
January 20-Monday	UNIVERSITY HOLIDAY (Martin L. King, Jr.'s Birthday)
January 22-Wednesday	LAST DAY TO APPLY FOR SPRING GRADUATION
January 27-Monday	Ronald E. McNair Memorial Day (classes are not canceled)
February 14-Friday	Grade Evaluation for Student Athletes
February 17-Monday	Deadline to remove incompletes received Fall 1995
March 1-10/Fri.-Sun.	SPRING BREAK
March 3-Monday	Mid-term grades due for freshmen and student athletes
March 14-Friday	LAST DAY TO DROP A COURSE WITHOUT GRADE EVALUATION
March 20-Wednesday	Spring Convocation
March 24-28/Mon.-Fri.	Early Registration Advisement
March 28-Friday	UNIVERSITY HOLIDAY (Good Friday)
Mar. 31-Apr. 4/Sun.-Thur.	EARLY REGISTRATION FOR FALL 1997
April 7-Monday	LAST DAY TO WITHDRAW FROM THE UNIVERSITY WITHOUT GRADE EVALUATION
	Third Grade Evaluation for Student Athletes
April 24-Thursday	CLASSES END
April 25-Friday	READING DAY
April 26-May 2/Sat.-Fri.	FINAL EXAMS
May 3-Saturday	Grades due in the Office of the Registrar by 2:00 p.m.
May 7-Wednesday	Graduation letters for Seniors, 2:00 p.m.
May 10-Saturday	COMMENCEMENT

GENERAL INFORMATION

North Carolina Agricultural and Technical State University

HISTORICAL STATEMENT

North Carolina Agricultural and Technical State University was established as the A. and M. College for the "Colored Race" by an act of the General Assembly of North Carolina ratified March 9, 1891. The act read in part: *That the leading object of the institution shall be to teach practical agriculture and the mechanic arts and such branches of learning as relate thereto, not excluding academical and classical instruction.*

The College began operation during the school year of 1890-91, before the passage of the state law creating it. This curious circumstance arose out of the fact that the Morrill Act passed by Congress in 1890 earmarked the proportionate funds to be allocated in bi-racial school systems to the two races. The A. and M. College for the White Race was established by the State Legislature in 1889 and was ready to receive its share of funds provided by the Morrill Act in the Fall of 1890. Before the college could receive these funds, however, it was necessary to make provisions for Colored students. Accordingly, the Board of Trustees of the A. and M. College in Raleigh was empowered to make temporary arrangements for these students. A plan was worked out with Shaw University in Raleigh where the College operated as an annex to Shaw University during the years 1890-1891, 1891-1892, and 1892-1893.

The law of 1891 also provided that the College would be located in such city or town in the State as would make to the Board of Trustees a suitable proposition that would serve as an inducement for said location. A group of interested citizens in the city of Greensboro donated fourteen acres of land for a site and \$11,000 to aid in constructing buildings. This amount was supplement by an appropriation of \$2,500 from the General Assembly. The first building was completed in 1893 and the College opened in Greensboro during the fall of that year.

In 1915 the name of the institution was changed to The Agricultural and Technical College of North Carolina by an Act of the State Legislature.

The scope of the college program has been enlarged to take care of new demands. The General Assembly authorized the institution to grant the Master of Science degree in education and certain other fields in 1939. The first Master's degree was awarded in 1941. The School of Nursing was established by an Act of the State Legislature in 1953 and the first class was graduated in 1957.

The General Assembly repealed previous acts describing the purpose of the College in 1957, and redefined its purpose as follows: *"The primary purpose of the College shall be to teach the Agricultural and Technical Arts and Sciences and such branches of learning as related thereto, the training of teachers, supervisors, and administrators for the public schools of the State, including the preparation of such teachers, supervisors and administrators for the Master's degree. Such other programs of a professional or occupational nature may be offered as shall be approved by the North Carolina Board of Higher Education, consistent with the appropriations made therefor."*

The General Assembly of North Carolina voted to elevate the College to the status of a Regional University effective July 1, 1967.

On October 30, 1971, the General Assembly ratified an Act to consolidate the Institutions of Higher Learning in North Carolina. Under the provisions of this Act, North Carolina Agri-

cultural and Technical State University became a constituent institution of The University of North Carolina effective July 1, 1972.

Six presidents have served the Institution since it was founded in 1891. They are as follows: Dr. J. O. Crosby, (1892-1896). Dr. James B. Dudley, (1896-1925), Dr. F. D. Bluford (1925-1955), Dr. Warmoth T. Gibbs (1956-1960), Dr. Samuel DeWitt Proctor, (1960-1964), and Dr. Lewis C. Dowdy, who was elected President April 10, 1964. Dr. Cleon F. Thompson, Jr., served as Interim Chancellor of the Institution from November 1, 1980 until August 31, 1981. Dr. Edward B. Fort assumed Chancellorship responsibilities on September 1, 1981.

MISSION, PURPOSE AND GOALS OF THE UNIVERSITY

North Carolina Agricultural and Technical State University is a public, comprehensive, land-grant university committed to fulfilling its fundamental purposes through exemplary undergraduate and graduate instruction, scholarly and creative research, and effective public service. The university offers degree programs at the baccalaureate, master's and doctoral levels with emphasis on engineering, science, technology, literature and other selected areas. As one of North Carolina's three engineering schools, the university offers Ph.D. programs in engineering. Basic and applied research is conducted by faculty in university centers of excellence, in interinstitutional relationships, and through significant involvement with several public and private agencies. The university also conducts major research through engineering and its extension programs in agriculture.

For the present planning period (1992-1997), the University will continue to place emphasis on strengthening its programs in engineering, the sciences, and technology. The University is also authorized to plan, in conjunction with the University of North Carolina at Greensboro, a joint master's degree program in social work.

The purpose of the University is to provide an intellectual setting where students in higher education may find a sense of identification, belonging, responsibility, and achievement that will prepare them for roles of leadership and service in the communities where they will live and work. In this sense, the University serves as a laboratory for the development of excellence in teaching, research and public service.

The program of the University focuses on the broad fields of agriculture, engineering, technology, business, education, nursing, the liberal arts and science.

The major goals of the University as approved by the faculty in 1988 are as follows:

1. To help students to improve their interpersonal and communication skills
2. To insure adequate career preparation for students that will enable them to lead productive lives.
3. To develop innovative instructional programs that will meet the needs of a diverse student body and the expectations of the various professions.
4. To maintain an environment which fosters quality instruction and encourages the further professional development of faculty and staff which supports the ideals of academic freedom and shared governance.
5. To assist students in developing their powers of critical and analytical thinking.
6. To promote managerial efficiency in all administrative functions including the continued development of operational efficiency and productivity in the accounting and fiscal system of the University consistent with the needs of the various University programs and functions and with the expectations of state and federal regulations.

7. To assist students in developing in-depth competence in at least one subject area for a global economy and for an environment with changing technology.
8. To aid students in the further development of self-confidence and a positive self image.
9. To identify and secure additional sources for internal and external funds to support the development of competitive financial aid awards to academically qualified students and to needy students.
10. To further develop and maintain the institutional research and planning processes that are necessary for the continued competitiveness, relevance, productivity, and credibility of the University, its programs, and its operations.
11. To develop and maintain undergraduate and graduate programs of high academic quality and excellence.
12. To encourage research and other creative endeavors by the faculty and students.
13. To identify and help to satisfy educational, cultural and other public service needs in the state, nation, and international environment.
14. To plan, construct, and maintain physical facilities for the achievement of the goals of the educational programs, research, and administrative functions.

POLICY GOVERNING PROGRAMS AND COURSE OFFERINGS

All provisions, regulations, degree programs, course listings, etc., in effect when this catalogue went to press are subject to revision by the appropriate governing bodies of North Carolina Agricultural and Technical State University. Such changes will not affect the graduation requirements of students who enroll under the provisions of the catalogue.

NONDISCRIMINATION POLICY AND INTEGRATION STATEMENT

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, age, or handicap. Moreover, NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of white students.

NORTH CAROLINA A & T STATE UNIVERSITY supports the protections available to members of its community under all applicable Federal laws, including Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 799A and 845 of the Public Health Service Act, the Equal Pay and Age Discrimination Acts, the Rehabilitation Act of 1973, and Executive Order 11246.

THE UNIVERSITY OF NORTH CAROLINA

In North Carolina, all the public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. North Carolina Agricultural and Technical State University is one of the 16 constituent institutions of the multi-campus state university.

The University of North Carolina, chartered by the N.C. General Assembly in 1789, was the first public university in the United States to open its doors and the only one to graduate students in the eighteenth century. The first class was admitted in Chapel Hill in 1795. For the next 136 years, the only campus of the University of North Carolina was at Chapel Hill.

In 1877, the N.C. General Assembly began sponsoring additional institutions of higher education, diverse in origin and purpose. Five were historically black institutions, and another

was founded to educate American Indians. Several were created to prepare teachers for the public schools. Others had a technological emphasis. One is a training school for performing artists.

In 1931, the N.C. General Assembly redefined the University of North Carolina to include three state-supported institutions: the campus at Chapel Hill (now the University of North Carolina at Chapel Hill), North Carolina State College (now North Carolina State University at Raleigh), and Woman's College (now the University of North Carolina at Greensboro). The new multi-campus University operated with one board of trustees and one president. By 1969, three additional campuses had joined the University through legislative action: the University of North Carolina at Charlotte, the University of North Carolina at Asheville, and the University of North Carolina at Wilmington.

In 1971, the General Assembly passed legislation bringing into the University of North Carolina the state's ten remaining public senior institutions, each of which had until then been legally separate: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, the North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. This action created the current 16-campus University. (In 1985, the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University.)

The UNC Board of Governors is the policy-making body legally charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." It elects the president, who administers the University. The 32 voting members of the Board of Governors are elected by the General Assembly for four-year terms. Former board chairmen and board members who are former governors of North Carolina may continue to serve for limited periods as non-voting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a non-voting member.

Each of the 16 constituent institutions is headed by a chancellor, who is chosen by the Board of Governors on the president's nomination and is responsible to the president. Each institution has a board of trustees consisting of eight members elected by the Board of Governors, four appointed by the governor, and the president of the student body, who serves ex-officio. (The NC School of the Arts has two additional ex-officio members.) Each board of trustees holds extensive powers over academic and other operations of its institution on delegation from the Board of Governors.

ORGANIZATION OF THE UNIVERSITY
Board of Governors
The University Of North Carolina
D. Samuel Neill, Chairman
Class of 1997

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Mark L. Bibbs	Wallace N. Hyde	Maxine H. O'Kelley
Lois G. Britt	Jack P. Jordan	D. Wayne Peterson
John F. A. V. Cecil	Helen Rhyne Marvin	H. D. Reaves, Jr.
Derick S. Close	D. Samuel Neill	Harold H. Webb
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Orville D. Coward, Sr.	Barbara S. Perry	Joseph E. Thomas
John C. Fennebresque		

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James E. Holshouser, Jr. Samuel H. Poole

Ex-Officio

Keith Bryant

THE UNIVERSITY OF NORTH CAROLINA
OFFICERS OF ADMINISTRATION
(Sixteen Constituent Institutions)

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ROY CARROLL, B.A., M.A., Ph.D. <i>Vice President - Planning</i>	WYNDHAM ROBERTSON, A.B. <i>Vice President - Communications</i>	J. EARL DANIELEY, A.B., M.A., Ph.D. <i>Assistant to the President</i>
NATHAN F. SIMMS, JR., B.S., M.S., Ph.D. <i>Vice President - Student Services</i>	DAVID G. MARTIN, B.A., LL.B. <i>Vice President - Public Affairs</i>	
<i>and Special Programs</i>		

**GOVERNANCE OF NORTH CAROLINA AGRICULTURAL
AND TECHNICAL STATE UNIVERSITY**

North Carolina Agricultural and Technical State University is a constituent institution of The University of North Carolina. It functions under the jurisdiction of a thirty-two member Board of Governors of The University of North Carolina elected by the General Assembly of North Carolina. Policies of the Board of Governors are administered by the President of the University and his staff. They constitute the General Administration and are located in Chapel Hill.

The Board of Trustees of North Carolina Agricultural and Technical State University consists of thirteen members. Eight members are appointed by the Board of Governors, four are appointed by the Governor of the State, and the President of the Student Government Asso-

ciation serves as an ex officio member. The Board of Trustees received its authority by delegation from the Board of Governors.

The Chancellor is the chief administrative officer of the University.

The University Senate and The University Council are the principal policy recommending bodies of the institution.

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY BOARD OF TRUSTEES

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HOWARD A. CHUBBS
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OFFICERS OF ADMINISTRATION

EDWARD B. FORT,
B.S., M.S., ED.D., LL.D.
Chancellor
HAROLD L. MARTIN, SR.,
B.S., M.S., Ph.D., P.E.
Vice Chancellor for Academic Affairs
CHARLES C. McINTYRE,
B.S., M.B.A.
Vice Chancellor for Business and Finance

SULLIVAN WELBORNE,
B.S., M.S., Ed.D.
Vice Chancellor for Student Affairs
NORMAN W. HANDY, JR.,
B.S., D.D., Ed.D.
Vice Chancellor for Development and University Relations
EARNESTINE PSALMONDS,
B.S., M.Ed., Ph.D.
Vice Chancellor for Research

DOROTHY J. ALSTON,
B.S., M.A., Ed.D.
Special Assistant to the Chancellor for Administrative Affairs
BENJAMIN E. RAWLINS,
B.A., J.D.
Special Assistant to the Chancellor — Legal Counsel

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CHARLES WILLIAMS,
B.S., M.S., Ph.D.
Associate Vice Chancellor for Academic Affairs
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B.A., M.A., Ph.D.
Assistant Vice Chancellor for Academic Affairs
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B.S., M.S., Ph.D., P.E.
Interim Dean, College of Engineering
QUIESTER CRAIG,
B.A., M.B.A., Ph.D.
Dean, School of Business and Economics
A. JAMES HICKS,
B.S., Ph.D.
Dean, College of Arts and Sciences

DAVID BOGER,
B.S., M.S., Ph.D.
Dean, School of Education
MEADA GIBBS,
B.S., M.S., Ph.D.
Dean, The Graduate School
DANIEL GODFREY,
B.S., M.S., Ph.D.
Dean, School of Agriculture
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B.S.N., M.S.N., Ph.D., RN,
F.A.A.N
Dean, School of Nursing
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B.A., M.A., Ph.D.
Dean, School of Technology
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Director of Institutional Assessment
WALTRENE CANADA,
B.S., M.L.S.
Director of Library Services
DORIS GRAHAM,
B.S., M.S.
University Registrar

JOHN SMITH,
B.S., M.S.
Director of Admissions
LTC. RONALD K. MURPHY,
B.S., M.S.
Professor of Aerospace Studies
LTC. ROBERT L. WEEKS,
B.S., M.S.
Professor of Military Science
SANDRA ALEXANDER,
B.S., M.A., Ph.D.
Director of The Freshman Advisement and Learning Assistance Center
GODFREY UZOCHUKWU,
B.S., M.S., Ph.D.
Director of Waste Management Institute
VYVIEN FORD-BREWINGTON,
B.A., M.Ed., M.S.
Director, Enhanced Skills Training Program

Student Affairs

SULLIVAN WELBORNE,
B.S., M.S., Ed.D.

*Vice Chancellor for Student
Affairs*

JAMES SIBERT,

B.S., M.S., Ed.D.
*Associate Vice Chancellor for
Student Affairs*

DOROTHY HARRIS,

B.S., M.S., Ed.D.
*Assistant Vice Chancellor for
Student Development*

LEON WARREN,

B.S., M.S.
*Assistant Vice Chancellor for
Career Services*

JOE WILLIAMS,

B.S., M.S.
Director of Housing

ROBERT L. WILSON,

A.B., M.S., Ph.D.

Director of Counseling Services

JAMES ARMSTRONG,

B.S., M.A.
Director of Memorial Union

SHARON R. MARTIN,

B.S., M.S.
*Director of International and
Minority Student Affairs*

E. PEGGY OLIPHANT,

B.S., M.S.
*Director of Veterans and Handi-
capped Student Affairs*

LINDA WILSON,

B.S.N., M.S.
Director of Health Services

MARVA WATTINGTON,

B.S., M.S.

Director of Student Activities

CHARLIE WILLIAMS,

B.S., M.S.
Director of Special Services

BEVERLY WALLACE,

B.S., M.S.
Director of Upward Bound

RALPH BROWN,

B.S., M.S.
*Assistant Vice Chancellor for Stu-
dent Activities*

Business and Finance

CHARLES C. McINTYRE,

B.S., M.B.A.
*Vice Chancellor for Business and
Finance*

MAXINE D. DAVIS,

B.S., M.S.
*Assistant Vice Chancellor for
Business and Finance and
Business Manager*

PAULA M. JEFFRIES,

B.S.
*Assistant Vice Chancellor for
Business and Finance and
Comptroller*

RENEE K. MARTIN,

B.S., M.B.A.
*Acting Director of Student
Financial Aid*

JONAH SMITH,

B.S.
Budget Director

SCOTT HUMMEL,

B.S., C.P.A.
Director of Accounting

LILLIAN M. COUCH,

B.S.
Director of Personnel Services

JOSEPH DAUGHTRY,

A.A., B.A.
Director of Police Admin.

LAVONNE MATTHEWS

B.A.
Director of Contracts and Grants

BOBBY ALDRICH,

B.A.
Director of Purchasing

ANDRE JAMES,

B.S.
Director of Auxiliary Services

RONALD W. GALES,

B.S.
University Engineer

SHIRLEY MEDLEY,

B.S., M.S.
Acting Treasurer

VACANT

Food Service Director

Shaw Food Service

KATHERINE BURKLEY,

B.S., C.P.A.
Assistant Comptroller for

Reporting

EUGENE BACKMON,

B.S.
*Assistant Vice Chancellor for
Business and Finance/Facilities*

Development and University Relations

NORMAN W. HANDY, JR.,

B.S., D.D., Ed.D.
*Vice Chancellor for Development
and University Relations*

LILLIE S. KING,

B.S., M.A., Ph.D.
*Assistant Vice Chancellor for
Development*

RICHARD MOORE,

B.S., M.S., Ed. D.
*Assistant Vice Chancellor for
University Relations*

VELMA SPEIGHT,

B.S., M.S. Ed., Ph.D.
Director of Alumni Affairs

DOROTHY R. COPELAND,

B.S., M.S.
Director of Community Relations

Administrative Affairs

DOROTHY J. ALSTON,
B.S., M.A., Ed.D.

*Special Assistant to the Chancellor
for Administrative Affairs*

MARJORIE WHITE,
B.S., M.S.

*Acting Director of Institutional
Research and Planning*

WILLIE J. MOORING,
B.S.

Director of Computer Center

SHARON B. NEAL,
B.S.

Salary Administrator

MARY G. MIMS,
B.S., M.P.A., C.P.A.

*Administrator for Information
Services and Policy Development*

REGINALD WADE,
B.S.

Director of Internal Auditing

Research

EARNESTINE PSALMONDS,
B.S., M.Ed., Ph.D.

Vice Chancellor for Research

Officers Emeriti

LEWIS C. DOWDY,
A.B., M.A., Ed.D., Litt. D.

Chancellor Emeritus

LOCATION

North Carolina Agricultural and Technical State University is located in the City of Greensboro, North Carolina. This city is 300 miles south of Washington, D.C. and 349 miles north of Atlanta. It is readily accessible by air, bus and automobile.

The city offers a variety of cultural activities and recreational facilities. These include athletic events, concerts, bowling, boating, fishing, tennis, golf and other popular forms of recreation.

The University is located near major shopping centers, churches, theaters and medical facilities. The heavy concentration of manufacturing plants, service industries, governmental agencies and shopping centers provide an opportunity for many students who desire part-time employment while attending the University.

THE PHYSICAL PLANT

The main campus of the University is located on land holdings in excess of 187 acres. The University farm located east of the Greensboro City limits includes approximately 550 acres of land and modern farm buildings. The approximate value of the physical plant is \$65 million.

University Buildings

L. C. Dowdy Administration Building
Dudley Memorial Building
F. D. Bluford Library
Richard B. Harrison Auditorium
Charles Moore Gymnasium
Coltrane Hall (Headquarters for
N.C. Agricultural Extension Service)
The Memorial Union
The Oaks (Chancellor's Residence)
The Ellis F. Corbett Center
The Joseph Bryan House

Class Room and Laboratory Buildings

Carver Hall — School of Agriculture
Cherry Hall — College of Engineering
Crosby Hall — College of Arts and Sciences
Gibbs Hall — Social Sciences & School of
Graduate Studies
Hodgin Hall — School of Education
Noble Hall — School of Nursing
Benbow Hall — Human Resources and Family
Planning
Garret House — Human Resources and Family
Planning
Hines Hall — Chemistry
Graham Hall Annex — Rockwell Center
Socwell Hall — Agricultural Technology
Ward Hall — Dairy Manufacturing Reid Green-
houses — Plant Science
Graham Hall — College of Engineering
Frazier Hall — Music-Art
Price Hall — School of Technology
Price Hall Annex — Child Development
Laboratory
Campbell Hall — ROTC Headquarters
Barnes Hall — Biology
Merrick Halls — School of Business and
Economics
J. M. Martena Hall — Physics, Mathematics &
Physical Science
Reed African Heritage Center — Museum

BC Webb Hall — Animal Science

Ron McNair Hall — College of Engineering

Residence Halls

Curtis Hall
Holland Hall
Morrison Hall
Morrow Hall
Gamble Complex
Vanstory Hall
Cooper Hall
Bluford Street Honors House
Benbow Street Honors House
Daniel Street Honors House
Scott Hall
Zoe P. Barbee Hall
Alex Haley Hall
Holt Hall

Service Buildings

Murphy Hall — Student Services
Dowdy Building — Student Financial Aid
Office
Williams Hall — Cafeteria
Brown Hall — Post Office, Bookstore
Sebastian Health Center
T. E. Neal Heating Plant
Clyde Dehuguley Physical Plant Building
Edwards House — Police Center
Music Annex

Other Facilities

Alumni Stadium
Athletic field — including three practice fields
for football quarter mile track, baseball diamond.
Register House
Strickland Fieldhouse
Environmental Studies Lab-Farm
Swine Research Center-Farm
Charles H. Moore School — Agriculture
Research Center

COLLEGES, SCHOOLS AND DIVISIONS OF NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY

North Carolina Agricultural and Technical State University includes the following colleges, schools and divisions: The School of Agriculture, The College of Arts and Sciences, The School of Business and Economics, The School of Education, The School of Technology, The College of Engineering, The School of Nursing, The Graduate School, and the Division of Continuing Education and Summer School.

ACCREDITATION AND INSTITUTIONAL MEMBERSHIPS

North Carolina Agricultural & Technical State University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor's, master's, and doctoral degrees.

The program of Industrial Technology is accredited by the National Association of Industrial Technology

The Media Program is accredited by the Association of Educational Communications and Technology

The undergraduate programs in agricultural, architectural, electrical, industrial, and mechanical engineering, leading to the B.S. degree, are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology

The undergraduate program in Landscape Architecture is accredited by the Landscape Architecture Accreditation Board

The School of Nursing is accredited by the National League for Nursing, Department of Baccalaureate and Higher Degree Programs

The Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education

The Department of Chemistry is accredited by the American Chemical Society

The School of Business and Economics is accredited by the American Assembly of Collegiate Schools of Business

The Department of Accounting is accredited by the American Assembly of Collegiate Schools of Business

The Social Work Program of the Department of Sociology and Social Work is accredited by the Council on Social Work Education

The Department of Home Economics is accredited by The American Home Economics Association

The Music Department is accredited by the National Association of Schools of Music

The University holds institutional membership in the following associations:

American Association of Colleges for Teacher Education

American Association of Collegiate Registrars and Admission Officers

National Association of State Universities and Land Grant Colleges

American Association of Colleges of Nursing

American College Public Relations Association

American Council for Construction Education

Associated Schools of Construction

American Council on Education

American Public Welfare Association

American Library Association
 Association of American Colleges
 Association of Collegiate Deans and Registrars
 Association of Collegiate Schools of Architecture
 College Language Association
 National Association of Business Teacher Education
 American Personnel and Guidance Association
 National Association of Industrial Technology, International Association of Technology Education
 National Association of Student Personnel Administrators
 Association of College Unions International
 National Association of College and University Food Service
 National Commission on Accrediting
 National Institutional Teacher Placement Association
 National League for Nursing, Council of Member Agencies Department of Baccalaureate and Higher Degree Programs
 North Carolina Association of Colleges and Universities
 North Carolina League of Nursing
 North Carolina Library Association
 National Association of College and University Business Officers
 National Association of Business Teacher Education
 American Personnel and Guidance Association
 National Association of Industrial Technology, International Association of Technology Education, and the American Driver and Traffic Safety Education Association
 National Association of Student Personnel Administrators
 Association of College Unions International
 National Association of College and University Food Service
 National Commission on Accrediting
 National Institutional Teacher Placement Association
 National League for Nursing, Council of Member Agencies, Department of Baccalaureate and Higher Degree Programs
 North Carolina Association of Colleges and Universities
 North Carolina League of Nursing
 North Carolina Library Association
 Southeastern Library Association
 Southern Regional Education Board Council on Collegiate Education for Nursing
 Graduates of the University are eligible for membership in the American Association of University Women
 The Theater Arts Program in Acting is accredited by The National Association of Schools of Theater

DEGREE PROGRAMS

Degree Program. A program of study with a concentration or (major) in some specified discipline specialty that leads to a degree in that discipline specialty, or in some designated subdivision of the specialty at a particular level of instruction.

All four year degree programs at the University require a minimum of 124 semester hours and a maximum of 128 semester hours, excluding deficiency courses and remedial work for the Bachelor's degree. Semester hour requirements beyond 128 must be approved by the Board of Governors.

Degree Program Track. A variation of an existing degree program, which leads to a degree in the same discipline specialty at the same level of instruction but differs in its specific course requirements within that specialty area.

Students who complete one or more of the courses of study offered by the University will be awarded the degree indicated.

ACADEMIC DEGREE PROGRAMS

School of Agriculture		
Degree	Track Title	Concentration
B.S.	Agricultural & Environmental Systems Engineering	
	Agricultural Business	Agricultural Economics
	Agricultural Business	Horticulture
	Agricultural Economics	
	Agricultural Education	
	Agricultural Science	Animal Science
	Agricultural Science	Earth & Env. Science
	Agricultural Science	Plant Science
	Agricultural Science	Soil Science
	Agricultural Science, Technology	Plant Science
	Agricultural Technology	AG/Industrial Technology
	Agricultural Technology	Animal Husbandry
	Agricultural Technology	Soil Science
	Child Development	
	Child Development: Early Ed. & Family Studies (B-K) (Teaching)	
	Clothing and Textiles	
	Food Administration	
	Food and Nutrition (Including Dietetics)	
	Food Science	
	Home Economics Education	
M.S.	Laboratory Animal Science	
	Landscape Architecture	
	Agricultural Education	
	Agricultural Marketing	
	Animal Health Science	
	Food and Nutrition	
	Plant and Soil Science	
	Production Economics	
	Rural Development	

College of Arts & Sciences

Degree	Track Title	Concentration
B.A.	Art, Design	
	Art, Painting	
	Broadcast News	
	Broadcast Production	
	English	
	French	
	History	
	Music	
	Music	General
	Political Science	Performance
	Print Journalism	
	Psychology	
	Public Relations	
	Sociology	
	Speech	
	Speech and Theatre	
	Professional Theatre	
B.F.A.		
B.S.	Art Education	
	Biology	
	Biology, Secondary Education	
	Chemistry	
	Chemistry, Secondary Education	
	Engineering Mathematics	
	Engineering Physics	
	English, Secondary Education	
	French, Secondary Education	
	History, Secondary Education	
	Mathematics	
	Mathematics, Secondary Education	
	Music Education	
	Physics	
	Physics, Secondary Education	
	Social Science, Education	
B.S.W.	Social Work	
M.A.	English, Afro-American Literature	
M.S.	Applied Mathematics	
	Art Education, Secondary	
	Biology	
	Biology, Secondary Education	
	Chemistry	
	Chemistry, Secondary Education	
	English, Secondary Education	
	French	
	History, Secondary Education	
	Mathematics, Secondary Education	
M.S.W.F.	Social Science, Secondary Education	
	Social Work	

School of Business and Economics

Degree	Track Title	Concentration
B.S.	Accounting	
	Basic Business Education	
	Business Administration	
	Business Education, Secondary	
	Comprehensive Business Education	
	Economics	
	Finance	
	Management	
	Marketing	
	Office Administration	
	Transportation	

School of Education

Degree	Track Title	Concentration
B.S.	Elementary Education	
	Health and Physical Education	
	Recreation Administration	
	Special Education	
M.S.	Adult Education	
	Counselor Education	
	Educational Administration and Supervision	
	Educational Administration and Supervision	Supervision
	Educational Media	
	Elementary Education, Early Childhood	
	Elementary Education, General	
	Health and Physical Education	
	Human Resources	Agency Counseling Business and Industry
	Human Resources	
	Intermediate Education (4-6)	
	Physical Education	
	Reading Education	

College of Engineering

Degree	Track Title	Concentration
B.S.	Architectural Engineering	
	Chemical Engineering	
	Computer Science	
	Construction	
	Electrical Engineering	
	Environmental Engineering	
	Industrial Engineering	
	Mechanical Engineering	
	Transportation	
M.S.	Computer Science	
	Electrical Engineering	
	Engineering	
	Environmental Systems for Buildings	
	Facilities Systems Engineering	
	Industrial Engineering	
	Mechanical Engineering	
Ph.D.	Structural Analysis and Design	
	Electrical Engineering	
	Mechanical Engineering	

School of Nursing

Degree	Track Title	Concentration
B.S.N.	Nursing	

School of Technology

Degree	Track Title	Concentration
B.S.	Industrial Technology	Construction Management
	Industrial Technology	Electronics
	Industrial Technology	Graphic Communications
	Manufacturing Systems	
	Occupational Safety and Health	
	Technology Education	
	Vocational - Industrial Education	
M.S.	Technology Education	
	Vocational - Industrial Education	
M.S.I.T.	Industrial Technology	

FERDINAND DOUGLASS BLUFORD LIBRARY

The new University Library was occupied in June, 1991. The facility retains the name of the old library — The Ferdinand Douglass Bluford Library named for the third President of the institution. The four level building contains 153,428 square feet and will house more than 600,000 volumes.

The current holdings include more than 390,000 bound volumes, 1,939 serial subscriptions, and, as a select depository in North Carolina for United States government documents, the library contains a collection of over 211,800 official government publications. Other holdings include a superior collection in videotapes, microforms and other audio visuals. The library maintains special collections in Archives, Black Studies, Teacher Educational Materials, and a Chemistry Collection located in the Chemistry Department in Hines Hall on the campus.

Special services are provided through a formal and informal library use instructional program, computerized literature searching, document delivery, interlibrary loans, and public access photocopiers. During the academic year the library is open ninety-two hours each week as shown below. Variations in this schedule are posted at the front entrance of the library.

Monday-Thursday
8:00 a.m.-12:00 midnight
Friday
8:00 a.m.- 8:00 p.m.
Saturday
9:00 a.m.- 5:00 p.m.
Sunday
2:00 p.m.-10:00 p.m.
Late Night Study
Sunday-Thursday until 3:00 a.m.
(Remains Open Until 6:00 a.m. during exams)

Educational Support Centers

The University's educational support centers include the Learning Assistance Center, the Audiovisual Center, the Closed Circuit Television Facility, a 10-watt student-operated educational Radio Station, the Computer Center, the Reading Center, Language Laboratory, and the Center for Manpower Research and Training.

Museums

The African Heritage Center is an outstanding art museum. Throughout the year, this museum has on display a number of special exhibits of sculpture, paintings, graphics, and other media.

OFFICE OF CONTINUING EDUCATION AND SUMMER SCHOOL

The **Office of Continuing Education and Summer School** provides educational and training opportunities for the nontraditional learner who desires such for career change or advancement; for degree or certification requirements; or for intellectual and cultural stimulation. Activities conducted by this office include the *administration of Continuing Education, Summer School, Extended Day Program, International Programs and Adapted Physical Education*.

The **Continuing Education Program** provides the administrative structure and coordination of extension credit courses, conferences, workshops and short courses. The staff works with faculty and community groups to develop learning activities to meet the education needs of individuals or groups.

The **Extended Day Program** is the coordinating unit for departments that offer classes in the evening and on weekends for students who are employed or otherwise not available during the 8 to 5 day.

The **Summer School** consists of two 5-week sessions and a two week intercession, with short courses and workshops interspersed through the two sessions. This program provides summer study to meet the needs of graduate and undergraduate degree seeking students, teachers and other professionals, or any other persons for whom summer study will be of benefit in the attainment of their educational goals.

Additionally, the office also coordinates the **Adapted Physical Education Program**. This program provides training and technical assistance to physical educators, classroom teachers and other teachers of handicapped children in every local education administrative unit in the State.

THE COMPUTER CENTER

A computer facility is available to the University's faculty, staff and students for the development of curriculum programs, administrative systems, assistance in research and tutorial services.

The Computer Center provides two distinct services: administration data processing of students, personnel, and facilities data which entails system design, system development, system implementation; and support of academic instruction and research computing for the educational community and implements education software systems.

The Center maintains an application system library with the necessary documentation of all available software packages and computer instructional material available to faculty and students.

Available to the University community are ten computer laboratories equipped with on-line terminal devices and microcomputers providing instant response to the users in program development. Also available in the Center are hard copy, printers and VT terminals.

Two administrative computers forming a VAX computer cluster consisting of a VAX 6320 with 128 megabytes of memory and VAX 6510 with 128 megabytes of memory running a VMS operating system running on Ethernet via Decnet supporting COBOL, Datatrieve RDB,

All-in-1 (Office Automation) and FOCUS (DBMS) 4GL, WordPerfect, Financial and Student Information Software.

The academic computers consist of a VAX 4500 and a VAX 4300 with 128 megabytes of memory running a VMS Operating System. The VMS operating system supports COBOL, FORTRAN, BASIC, PASCAL, C, SPSSX, SAS, ADA, Smart Star (DBMS), and WordPerfect. Also a VAX-ALPHA RUNNING ULTRIX.

The Computer Center maintains a staff with experience in the following areas: business, mathematical, operations, systems development, programming, analysis and design. Consultation services are available upon request as well as Network support.

COOPERATIVE EDUCATION

Cooperative Education is a carefully organized and supervised program of "Experiential Learning" in which the participating student enriches his or her education by alternating periods of classroom study with periods of work related to his or her academic major. Undergraduate placements are available in Technology, Engineering, Business, Arts and Sciences; and Agriculture, Graduate Students in Engineering, Human Resources, and Agriculture may also apply. Each applicant must have established a 2.0 or better grade point average.

Interested students must complete the freshman year prior to going on work assignment. Transfer students must successfully complete one semester of full-time study before they can be placed. The office is located in Murphy Hall.

THE LEARNING ASSISTANCE CENTER

The Learning Assistance Center is organized to provide special services to students who need assistance in strengthening their reading, communication and computational skills. The objective of this program is to help each enrollee to develop a foundation for completing his or her college career.

The program provides special classes in English, Reading and Mathematics. It offers tutorial services and helps the enrollees to develop study skills.

WASTE MANAGEMENT INSTITUTE

The Waste Management Institute coordinates the interdisciplinary waste management efforts of the University in the areas of instruction, research, and community outreach. Waste Management activities are conducted through faculty members and facilities of the participating departments.

Additionally, the Office of Waste Management administers an undergraduate certificate program. To receive a Waste Management certificate, students are required to complete 18-20 credit hours of approved Waste Management courses. The waste management certificate complements the student's academic major and enhances the value of the degree.

PIEDMONT INDEPENDENT COLLEGE ASSOCIATION OF NORTH CAROLINA

The Piedmont Independent College Association of North Carolina is an organization comprised of North Carolina Agricultural and Technical State University, The University of North Carolina at Greensboro, High Point College, Greensboro College, Bennett College, Guilford College and Guilford Technical Community College. The organization promotes interinstitutional cooperation and cooperative educational activities among the seven institutions. Agreements provide the opportunity for any student to enroll at another institution for a course or courses not offered on one's home campus.

OFFICE OF DEVELOPMENT AND UNIVERSITY RELATIONS

The Office of Development and University Relations is maintained by the University not only to assist with the overall institutional development, but also to promote its continual interest among alumni, parents, friends, foundations, corporations and other sectors of the national community. It encourages annual alumni giving, deferred giving and conducts special fund campaigns. The office embraces the following areas of operation: Alumni Affairs, Community Relations, Public Information, Industry Cluster, Fund Raising, Publications, Public Relations, Legislative Relations, Industrial Liaison, Sports Publicity and special educational projects.

In addition, the Office aids in conducting the affairs of the North Carolina A&T University Foundation, Inc., which has been established to assist in soliciting gifts, grants and contributions from other than state sources for such worthy purposes as student scholarships, faculty development, library resources, specialized equipment, and cultural and public service programs.

The Office is conveniently located in Suite 400 of the Dowdy Administration Building.

DIVISION OF RESEARCH

The Division of Research was established for the purpose of promoting research at the university by encouraging and assisting faculty members to develop proposals for research projects and educational programs. In so doing, it also insures that sponsored support for research and academic projects is compatible with university objectives, avoids unnecessary duplication of programs, assures compliance with special safeguard procedures of the sponsoring agencies, and publishes and disseminates the research conducted at the university.

Additionally, the Division of Research is organized to administer the research programs of the university. It has the primary responsibility of establishing contact and maintaining a liaison with federal and state funding agencies to keep abreast of current information. The office compiles and disseminates descriptive materials to faculty interested in extramurally funded activities. The office serves as a conduit through which flows pertinent and valuable information between the university and the support agencies. The office operates a grantsmanship library consisting of the most up-to-date directories, program brochures, guidelines, manuals, application forms and other material useful in seeking funds for projects.

AUXILIARY SERVICES

The Office of Auxiliary Services is responsible for administering, planning, and directing the University auxiliaries, such as the Bookstore, Food Service, and Ticket Operations. This office also supervises and serves as Business Manager for the Athletic Department.

Each auxiliary relates directly to the objectives of the University. Their significant contributions to the realization of University objectives are measured directly by the quality of services rendered. Such functions provide needed services and also allow the University to benefit from these services without substantial cost.

BOOKSTORE

The Bookstore is responsible for selling and distributing textbooks, study aids, student supplies, departmental supplies, and souvenirs to the students, faculty, and staff.

TICKET OFFICE

The University Ticket Office is located in Brown Hall at the corner of Laurel and Bluford Street. This office sells tickets for all university sponsored events and issues student athletic passes.

STUDENT LIFE

STUDENT DEVELOPMENT SERVICES

The Division of Student Affairs shoulders the major responsibility for Student Development Services. The Vice Chancellor of Student Affairs is the Chief Administrative Officer. The division is comprised of fourteen departments assigned to four major units that are supervised by the Assistant Vice Chancellor for Development, Assistant Vice Chancellor for Career Services, Associate Vice Chancellor for Student Affairs and Director of Housing.

Student Development Services at the University are organized for the purpose of providing programs and services that complement the academic mission of the University and contribute to the intellectual social moral, cultural, and physical development of students. These programs and services are designed to meet the expressed out-of-classroom needs of students while they pursue academic careers at the University.

As a support unit to the academic process, Student Affairs works with students in areas of counseling, leadership development, housing and student activities. Such activities assist students in finding “a sense of belonging, responsibility, and achievement.” The Division carries out its purpose through goals given below.

1. To provide leadership development opportunities for student leaders, Student Government Association, Student Union Advisory Board and other student organizations such as sororities and fraternities.
2. To provide improved services for students that impact upon their personal development.
3. To develop activities and programs that accommodate the special needs of commuter and adult students.
4. To provide programs to accommodate the special needs of minority students.

Consistent with the overall goals of the University, Student Development Services include the following array of programs and activities: (1) Academic Advising, (2) Counseling Services, (3) Career Services, (4) Student Government Association, (5) Student Activities and Publications, (6) Health Services, (7) Intramural and Intercollegiate Athletics, (8) Veteran Affairs, (9) Handicapped Student (10) Student Support Services, (11) Housing & Residence Life, (12) Student Union, (13) International Student Affairs, (14) Upward Bound Program, and (15) Student Development.

Some of the specific services are described as follows:

COUNSELING SERVICES

The University makes provisions for counseling, testing and guidance for all students through Counseling Services, located in 108 Murphy Hall.

Counseling Services conducts a testing program for all freshman students. The results of this program are used to assist freshmen in the planning of their educational and vocational careers. The Office conducts other testing programs that are required or desired by the departments of the University.

Counseling Services offers students the opportunity to discuss with a trained professional counselor or clinical psychologist any questions, dilemmas, needs, problems or concerns involving educational, career, social, personal or emotional adjustment that may occur during the college years.

The following is a list of services available through Counseling Services:

1. Individual and group personal counseling.
2. Academic and Career Counseling.
3. Individual test administration and interpretation covering the areas of intelligence, aptitude, personality, interest, achievement and other areas requiring special needs.
4. University Diagnostic and Placement Testing Program for all freshmen to assist in the planning of their educational and vocational careers and other programs required or desired by departments of the University.
5. College Level Examination Program (CLEP) for Course Credit by Examination.
6. National Testing Program which includes administration of the Graduate Record Examinations, National Teacher Examinations, Graduate Management Admission Test, Veterinary College Admissions Test and other similar examinations.
7. Graduate student internship training laboratory.
8. Graduate school information and cooperation in the placement of graduates who desire to pursue graduate studies.
9. Withdrawal Exit Interviews.
10. Outreach counseling programs and activities.

All counseling is voluntary, free of charge, private and confidential.

HEALTH SERVICES

The Sebastian Health Center is managed by a Director of Health Services. Medical services are available to all students in the student health center if they have paid the student health fee as part of their general university fee.

The basic components of the Health Service Program are as follows:

1. **Medical Services:** The University Physicians are in attendance in the Health Center daily (hours for routine treatment are posted) — and “On 24 hour call” for any emergency situations.
2. **Nursing Services:** Registered nurses, under the direction of a Head Nurse, are in attendance daily to treat and evaluate students health needs and answer any questions pertaining to health problems and other concerns.
3. **Laboratory Services:** A Certified Medical Technologist is on duty daily, Monday - Friday to perform various laboratory tests as ordered by the physician to diagnose a variety of medical problems.
4. **Medical Records:** All students must submit to the Health center a physical exam and proof of immunizations.
5. **Pharmacy Services:** A registered pharmacist is available Monday - Friday to dispense medication and provide patient teaching about all prescriptions filled.
6. **Health Education Services:** Prevention education is available through our health education on a variety of health conditions, someone is available Monday-Friday to assist with any health issues or concerns.

The center also undertakes to provide up-to-date and emerging information on health related issues and concerns on a continuing basis for the University Community.

DRUG AND ALCOHOL EDUCATION POLICY

Preamble:

The basic mission of North Carolina Agricultural and Technical State University is to provide an educational environment that enhances and supports the intellectual process. The academic community, including students, faculty and staff have the collective responsibility to ensure that this environment is conducive to healthy intellectual growth. The illegal use of harmful and addictive chemical substances and the abuse of alcohol pose a threat to the educational environment. Thus, this Drug and Alcohol Education Policy is being promulgated to assist members of the University community in their understanding of the harmful effects of illegal drugs and alcohol abuse, of the incompatibility of illegal drugs and the abuse of alcohol with the educational mission of the University; and of the consequences of the use, possession or sale of such illegal drugs and the abuse of alcohol, including the violation of applicable laws.

Objectives:

- I. To develop an educational program that increases the University community's knowledge and competency to make informed decisions relative to the use and abuse of controlled substances and alcohol; and
- II. To increase those skills and attributes required to take corrective action conducive to the health and well-being of potential drug and alcohol abusers.

Program Components:

There are five (5) components to this policy:

- I. Education
- II. Health Risks
- III. Rehabilitation
- IV. Sanctions
- V. Dissemination and Review

I. EDUCATION

It is the intent of the Drug and Alcohol Education Policy of North Carolina A&T State University to insure that all members of the University community (i.e. students, faculty, administrators and other employees) are aware that the use, sale and/or possession of illegal drugs and the abuse of alcohol are incompatible with the goals of the University. Moreover, each person should be aware that the use, sale or possession of illegal drugs and the abuse of alcohol is, as more specifically set forth later in this policy, subject to specific sanctions and penalties.

Each member of the University family is reminded that in addition to being subject to University regulations and sanctions regarding illegal drugs and the abuse of alcohol, they are also subject to the Laws of the State and of the nation. Each individual is also reminded that it is not a violation of "double jeopardy" to be subject to the terms of this policy as well as the provisions of the North Carolina General Statutes. For a listing of relevant State criminal statutes, please see Appendix A. Further questions may be directed to the Office of the University Attorney or the Office of Student Affairs.

Each member of the University community is asked to pay particular attention to the full consequences of the sanctions specified in this policy as well as the consequences of the North Carolina criminal law referenced above. Certain violations may jeopardize an individual's future as it relates to continued University enrollment or future employment possibilities, depending on individual circumstances.

Further, it is a policy of the University that the educational, legal and medical aspects of this issue be emphasized on an annual basis through the provision of programs and activities in the following areas:

- (a) Annual Drug and Alcohol Education Week — Workshops and seminars on drug abuse led by former drug addicts and community agencies such as MADD, SADD, and the Sycamore Center;
- (b) Drug and Alcohol Awareness Fair — Exhibits featuring drug and alcohol related paraphernalia;
- (c) Media presentations on University radio station, WNAA, emphasizing the most current programs with drug and alcohol education messages;
- (d) “Home for the Holidays, Don’t Drink and Drive”; Drug and Alcohol Abuse Prevention Campaign;
- (e) Publication of brochure on drug education;
- (f) Continuous monthly out reach programs in each residence hall.

Although directed primarily to the student population, the above noted educational programs shall also be open to participation by all categories of University employees.

Additionally, the Staff Development Office is the designated University department responsible for the planning and implementation of drug and alcohol education programs geared toward the special needs of the faculty and staff. Among the programs to be implemented by the Staff Development Office include lunch time seminars jointly conducted by the Sycamore Center, Greensboro Police Department and the Guilford County Mental Health Department.

Health risks, associated with the use of illicit drugs and the abuse of alcohol, are wide ranging and varied depending on the specific substance involved and individual abuse pattern. These risks include, but are not limited to:

1. Physical changes which alter bodily functions such as severely increased or decreased cardiac output; shallow to irregular respiration; and damage to other major organs, such as kidney, liver and brain;
2. Emotional and psychological changes including paranoia, depression, hostility, anxiety, mood swings and instability;
3. Additional health risks could include such illnesses as AIDS HIV infection, sexually transmitted diseases, severe weight loss, cancer, cirrhosis, hepatitis, short term memory loss, seizures, and deformities to unborn children;
4. Physical and psychological dependency (addiction); and
5. Death from overdose or continuous use.

While these health risks are broad in range, persons consuming illicit drugs and alcohol will exemplify some, if not all, of the above symptoms. see Appendix A for a list of a few specific drugs and their corresponding health risks.

II. HEALTH RISKS

Health Risks, associated with the use of illicit drugs and the abuse of alcohol, are wide ranging and varied depending on the specific substance involved and individual abuse pattern. These risks include, but are not limited to:

1. Physical changes which alter bodily functions such as severely increased or decreased cardiac output; shallow to irregular respiration; and damage to other major organs, such as kidney, liver and brain;

2. Emotional and psychological changes including paranoia, depression, hostility, anxiety, mood swings and instability;
3. Additional health risks could include such illnesses as AIDS-HIV infection, sexually transmitted diseases, severe weight loss, cancer, cirrhosis, hepatitis, short term memory loss, seizures, and deformities to unborn children;
4. Physical and psychological dependency (addiction); and
5. Death from overdose or continuous use.

While these health risks are broad in range, persons consuming illicit drugs and alcohol will exemplify some, if not all, of the above symptoms. See Appendix A for a list of a few specific drugs and their corresponding health risks.

III. REHABILITATION

The University recognizes that rehabilitation is an integral part of an effective drug and alcohol policy. Consistent with its commitment in the areas of education and sanctions, it is the University's intent to provide an opportunity for rehabilitation to all members of the University family. This commitment is evidenced through access to existing University resources and is furthered by referrals to community agencies.

Students:

The University Counseling Center and the Student Health Center are available to provide medical and psychological assessments of students with drug/alcohol dependency and drug/alcohol abuse problems. Based on the outcome of this assessment treatment can be provided by either or both of these centers. If, however, the scope of the problem is beyond the capability of these Centers, affected students will be referred to community agencies such as the Guilford County Mental Health Center and Greenpoint. The cost of such services shall be the individual's responsibility.

Employees:

Referrals to local community agencies will be made available to include the Guilford County Mental Health Center, Greenpoint and private physicians. The cost of such services will be the individual's responsibility. The services of the University's Counseling and Health Centers are not normally utilized by faculty and staff members except in emergency situations.

IV. SANCTIONS

A. Illegal Drugs/Prohibited Conduct

All members of the University community have the responsibility for being knowledgeable about and in compliance with the provisions of North Carolina Law as it relates to the use, possession or sale of illegal drugs as set forth in Article 5, Chapter 90 of the North Carolina General Statutes. Any violations of this law by members of the University family subjects the individual to prosecution both by the University disciplinary proceedings and by civil authorities. It is not a violation of "double jeopardy" to be prosecuted by both of these authorities. The University will initiate its own disciplinary proceedings against a student, faculty member, administrator or other employee when the alleged conduct is deemed to affect the interests of the University.

Penalties will be imposed by the University in compliance with procedural safeguards applicable to disciplinary actions against students (see the Student Handbook), faculty members (see the Faculty Handbook), administrators (see the Board of Governors Policies

Concerning Senior Administrative Officers as well as the EPA Non-Teaching Personnel Policies) and SPA employees (see State Personnel Commission Policies).

The penalties imposed for such violations range from written warnings with probationary status to expulsion from enrollment and discharges from employment. However, minimum penalties that apply for each violation are listed in Appendix A. For additional information, direct questions to the Office of the University Attorney or the Office of Student Affairs. It should be noted that where the relevant sanction dictates a minimum of one semester suspension from employment, the regulations of the State Personnel Commission (as pertaining to SPA employees) do not permit suspension from employment of this duration. Thus, such sanction as applied to SPA employees dictates the termination of employment.

B. Alcohol/Prohibited Conduct

1. Employees:

While the sale, possession, or consumption of alcoholic beverages is not illegal under state or federal law, it is, hereby, the policy of North Carolina A&T State University that the consumption of alcohol sufficient to interfere with or prohibit the otherwise normal execution of job responsibilities is improper and subjects the employee to appropriate disciplinary procedures. It is also the policy of North Carolina A&T State University that alcoholic beverages not be sold on campus. Employees violating the above noted policies are subject to appropriate disciplinary procedures which may range from warning and probation to dismissal consistent with the individual circumstances.

Similarly, employees are reminded that, under N.C. Law, it is illegal to sell or give malt beverages, unfortified wine, fortified wine, spirituous liquor or mixed beverages to anyone less than 21 years old. It is also illegal to aid and abet any person less than 21 years old in the purchase or possession of the alcoholic beverages noted above. Employees found violating these state laws are subject to legal sanction as well as the appropriate disciplinary procedures.

2. Students:

Students are reminded of the following University regulations and state laws regarding alcoholic beverages as contained in the Student Handbook.

1. Students are liable for violation of State Law GS 18B-302 while on University premises: 18B-302 Sale to or Purchase by Underage Persons

a. Sale — It shall be unlawful for any person to:

I. Sell or give malt beverages or unfortified wine to anyone less than 21 years old; or

II. Sell or give fortified wine, spirituous liquor, or mixed beverages to anyone less than 21 years old.

b. Purchase or Possession — It shall be unlawful for:

I. A person less than 21 years old to purchase, to attempt to purchase, or to possess malt beverages or unfortified wine; or

II. A person less than 21 years old to purchase, to attempt to purchase, or possess fortified wine, spirituous liquor, or mixed beverages.

c. Aider and Abettor

I. By Underage Person — Any person under the lawful age to purchase and who aids or abets another in violation of subsection (a) or (b) of this section shall be guilty of a misdemeanor punishable by a fine of up to five hundred dollars

(\$500.00) or imprisonment for not more than six months, or both, at discretion the of the court.

II. By Person over Lawful Age — Any person who is over the lawful age to purchase and who aids or abets another in violation of subsection (a) or (b) of this section shall be guilty of a misdemeanor punishable by a fine of up to two thousand dollars (\$2,000) or imprisonment for not more than two years, or both, at the discretion of the court.

1. Students are responsible for conforming to state laws pertaining to:
 - a. Transportation of alcoholic beverages
 - b. Consumption of alcoholic beverages in public places
 - c. Consumption of alcoholic beverages by students under the legal drinking age
 - d. Abuses of alcoholic beverages.
2. There will be no consumption of alcoholic beverages in a motor vehicle while on University property or on University streets.
3. Consumption of alcoholic beverages is restricted to students' rooms in residence halls, if they are of legal drinking age.
4. The possession or consumption of alcoholic beverages shall not be permitted in public places; that is: lounges, game rooms, study rooms, kitchens, laundries or patios.
5. There will be no public display of alcoholic beverages.
6. The University discourages the drinking of alcoholic beverages, and other abuses of alcoholic beverages. Being under the influence of alcohol is considered a breach of conduct and students who violate these standards are subject to disciplinary action.

Violations of the above regulations and laws will subject students to criminal prosecution as well as campus based charges.

C. Suspension Pending Final Disposition

The University reserves the right through the Chancellor or his designee to suspend a student, faculty member, administrator and other employee between the time of the initiation of charges and the hearing to be held. Such decision will be made based on whether the person's continued presence within the University community will constitute a clear and immediate danger or disruption to the University. In such circumstances the hearing will be held as promptly as possible.

V. DISSEMINATION

A copy of the Drug and Alcohol Education Policy will be distributed on an annual basis to each employee and student of the University. A distribution to all enrolled students will occur as a part of the registration process. The distribution to University employees will be administered by the University Personnel Office.

The Chancellor of the University shall insure on a biennial basis that this policy is reviewed for purposes of assessing its effectiveness, consistency of application of sanctions and to determine the necessity for modification. This review shall be conducted by October 15 of every other year, beginning in 1992.

CONCLUSION

A&T State University recognizes that the use of illegal drugs and the abuse of alcohol is a national problem and that sustained efforts must be made to educate the University family

regarding the consequences associated there with drug and alcohol abuse. The primary emphasis in this policy has therefore been on providing drug and alcohol abuse counseling and rehabilitation services through the various programs and activities outlined above.

Past experience suggests that most members of the University family are law abiding and will use this policy as a guide for their future behaviors and as a mechanism to influence their peers and colleagues in a positive direction. However, those who choose to violate any portions of this policy will pay the penalty for non-compliance. The main thrust of this policy has been to achieve a balance between its educational and punitive components.

The effective implementation of this policy rests on its wide dissemination to all members of the University family. This will be accomplished by the dissemination procedure previously outlined and through its publication in the faculty handbook, student handbook and University catalogue. Additionally, all affected individuals will be assured that applicable professional standards of confidentiality will be maintained at all times.

FOOD SERVICES

The University provides food services for students at a reasonable cost. A snack bar is located in the Memorial Student Union Building. Students who live in the residence halls are required to eat in the cafeterias. Students who live off campus may purchase meals also.

HOUSING & RESIDENCE LIFE

Housing and Residence Life provides an educationally stimulating environment supportive of the academic mission of our students and the University.

Our mission includes providing reasonably priced living accommodations, which are clean, attractive, well maintained, safe, secure and comfortable.

Student Residential Programs are committed to the concept of community. We educate our students to appreciate the diverse community in which we live.

THE MEMORIAL UNION

The Memorial Union provides a magnificent environment conducive to enhancing the academic endeavors of students through leadership development, cultural and social programs. It is a "Community Center" serving diverse needs. It embraces a wide variety of facilities and performs a multiplicity of functions.

The facilities include: Lounges, Reading Room, Student Organization Meeting Rooms, Music Room, Games Rooms, Ballroom, Office Space, Bowling Lanes, Snack Bar, Information Center, Barber Shop, Beauty Shop and Guest Rooms.

Additionally, the Memorial Union serves as a Student Activity Headquarters, Recreation Center, Cultural Center, Public Relations Agency, Art Gallery, Forum and Workshop Center.

The physical proximity provides a co-curricular community for students, faculty, alumni and publics served by the University. The Memorial Union facilitates a positive social, recreational and cultural mission.

STUDENT ORGANIZATIONS AND ACTIVITIES

The University provides a well-balanced program of activities for moral, spiritual, cultural and physical development of the students. Religious, cultural, social and recreational activities are sponsored by various committees, departments, and organizations of the University. Outstanding artists, lecturers and dramatic productions are brought to the campus.

A listing of student organizations, their purposes, objectives, chief officers, and advisors are published annually by the Offices of Student Activities and Assistant Vice Chancellor for Student Development. This document is available upon request by any office.

STUDENT CONDUCT

Students enrolled at North Carolina Agricultural and Technical State University are expected to conduct themselves properly at all times. They are expected to observe standards of behavior and integrity that will reflect favorably upon themselves, their families and the University. They are expected to abide by the laws of the city, state, and nation, and by all rules and regulations of the University.

Accordingly, any student who demonstrates an unwillingness to adjust to the rules and regulations that are prescribed or that may be prescribed to govern the student body will be placed on probation, suspended or expelled from the institution.

A student may forfeit the privilege of working for the University when, for any reason, he or she is placed on probation because of misconduct.

VETERANS AFFAIRS

North Carolina A&T is an approved University for veterans and veteran dependents, who wish to attend and receive educational benefits.

Persons wishing to attend the University under the Veterans Administration Educational Training Program should apply first to the Veterans administration for a Certificate of Eligibility. Simultaneously, they should apply for admission to North Carolina A&T State University through normal admissions procedures. The issuing of a Certificate of Eligibility by the Veterans Administration does not automatically assure a student of admission to the University.

The Office of Veterans Affairs located in Suite 005 Murphy Hall has been established to assist veterans with enrollment and adjustment to college life. Upon enrolling at the University, the veteran or eligible person should report to the Office of Veterans Affairs for certification. If a Certificate of Eligibility has not been issued, the veterans or the eligible person should see the University Certifying Official.

Additionally, the Office of Veterans Affairs provides counseling, and tutorial services.

DISABILITY SUPPORT SERVICES

The Office of Disability Support Services is established to assure ready accessibility of all academic programs, services, and activities, to any person with a disability matriculating at the University. Likewise, it focuses on facility accessibility.

The Office serves as a liaison for all students with disabilities as they participate in programs and activities enjoyed by all students. Additionally, the office arranges for any needed reasonable accommodations. Documentation is required.

All information and services for persons with disabilities are handled through this office located in Suite 005 Murphy Hall. Students are encouraged to take advantage of these services.

OFFICE OF CAREER SERVICES

The Office of Career Services at North Carolina Agricultural and Technical State University has as its primary mission, to provide a wide-range of programs, services and resources in order to aid students in early career exploration, as well as, offering career assistance to alumni of the University. These services include the following:

- Act as liaison between students and employers, acquainting them with career opportunities.
- Work with academic deans, faculty members and administrators to help bridge the gap between the classroom and the world-of-work.
- Assist students through individual and group counseling.
- Help students and alumni in identifying career search strategies.
- Provide cooperative education experiences.

Services are always performed with a conscientious and sincere interest in the students as well as the prospective employers. The Office of Career Services is located in Room 101, Murphy Hall.

MINORITY AFFAIRS

The Office of Minority Affairs was created in order to assist minority (white) students in the development and accomplishment of their educational goals. Housed in the Counseling Services Office, Minority Student Affairs is open from 8:00 a.m. to 5:00 p.m. and is staffed by a Coordinator/Counselor.

The current percentage of minority (white) students is approximately 12% of the student population. This means about 850 minority students are enrolled at North Carolina A & T State University.

OFFICE OF INTERNATIONAL STUDENT AFFAIRS

The Office of International Student Affairs provides services and programs for international students. The Office provides assistance with pre-arrival preparation, the admission process, housing and immigration matters. Orientation and advisement are provided to assist students with their adjustment to the University and community. In cooperation with various departments and organizations, the office provides activities that enhance cultural, social and personal development.

Students are encouraged to promote multicultural understanding by participating in a variety of activities in the Greensboro community.

Two hundred and eighty international students attend the University and they represent 48 countries.

Eligibility for issuance of the Form I-20 [Certificate of Eligibility for Non immigrant (F-1) Student Status for Academic and Language Students] is evaluated by the Office of International Students, upon receipt of all official documents, including a financial guarantee. J-1 Non-immigrants who possess valid IAP-66s to matriculate at this university. Immigrants must show verification of their immigrant status (Form I-551).

Non-immigrant and immigrant students (international students) are required to verify their immigration status to the International Student Affairs Office before registering at the University and notify the Office immediately of any change in their immigration status and address. Returning non-immigrants must update their files in the International Student Affairs Office within ten days of enrollment every semester.

All non-immigrants are responsible for maintaining their legal immigration status. Non-immigrant students in F-1 visa status are required by United States Immigration regulations to be enrolled full-time, except for the summer terms. Full-time enrollment is defined as enrollment every term in a minimum of 12 semester hours (undergraduate), or nine semester hours (graduate).

The legal regulations governing non-immigrant student employment are complex. The Director of the International Student Affairs Office is available to explain these regulations and verify who is eligible for employment.

Non-immigrant students are required to maintain comprehensive health and accident insurance coverage that includes repatriation and medical evacuation. Students must purchase insurance on a semester basis during registration. The policy must have specific levels of coverage to ensure that it is adequate to provide for medical costs in the U.S. Students are advised not to purchase insurance policies prior to arrival unless it is coverage to cover the period from departure until enrollment in a new policy at the University. Government sponsored students and students with pre-existing medical conditions who have insurance should not cancel their insurance in order to purchase the University recommended plan. These students should consult with the Director of International Student Affairs in regards to their coverage.

A non-immigrant student is considered a non-resident and is assessed non-resident (out-of-state) fees.

The office is located in Murphy Hall, Room 221, at the corner of Nocho Street and S. G. Thomas Drive. The Telephone Number is (910) 334-7551.

EXPENSES AND FINANCIAL AID

GENERAL INFORMATION

NORTH CAROLINA A & T STATE UNIVERSITY IS A PUBLICLY SUPPORTED INSTITUTION. TUITION PAYMENTS AND OTHER REQUIRED STUDENT FEES MEET ONLY A PART OF THE TOTAL COST OF THE EDUCATION OF STUDENTS ENROLLED. ON THE AVERAGE, FOR EACH FULL-TIME STUDENT ENROLLED IN AN INSTITUTION OF THE UNIVERSITY OF NORTH CAROLINA, THE STATE OF NORTH CAROLINA APPROPRIATED \$6,542 PER YEAR IN PUBLIC FUNDS TO SUPPORT THE EDUCATIONAL PROGRAMS OFFERED.

THE UNIVERSITY RESERVES THE RIGHT TO INCREASE OR DECREASE ALL FEES AND CHARGES AS WELL AS ADD OR DELETE ITEMS OF EXPENSE WITHOUT ADVANCE NOTICE AS CIRCUMSTANCES, IN THE JUDGMENT OF THE ADMINISTRATION, MAY REQUIRE.

Boarding and Lodging fees are based on the actual number of days school is in session and do not include holidays, breaks, or any other University Vacations.

Students' property in dormitories and other University buildings is at the sole risk of the owner, and the University is not responsible for loss, theft, or damage to such property arising from any cause.

Students are required to pay for any loss or damage to University property at replacement cost due to abuse, negligence, or malicious action, in addition to being subject to disciplinary action.

The University converted to a book purchase system effective Fall Semester, 1991. All undergraduate and graduate students are required to purchase all textbooks. This includes hard cover and paperback textbooks. The cost will vary according to academic discipline. Other policies and procedures governing the book purchase system can be obtained from the Bookstore.

Personal spending money should be sent directly to and made payable to the student in the form of money orders or certified checks. As a policy, the University does not cash personal checks for students in any amount.

Diplomas and transcripts are withheld until the student has paid in full all fees and charges due the University. A student in debt to the University in any amount will not be permitted to register for any subsequent semester until his or her obligations are paid. If special financial arrangements have been made, failure to comply with these arrangements as stipulated will result in the student being withdrawn from the University for nonpayment of required fees.

Special Notice to Veterans

Veterans attending school under the provisions of Public Law 89-358 receive a monthly subsistence allowance from the Veterans Administration. Therefore, veterans are responsible for meeting all of their required fee obligations.

Veterans attending school under the provision of Public Law 894 (Disabled Veterans) receive a monthly subsistence allowance from the Veterans Administration and also, the Veterans Administration pays directly to the school the cost of the veteran's tuition and required fees. All other fees are the responsibility of the veteran.

Veterans may contact the Veterans Affairs Office on Campus for any special consideration which may be available.

REQUIRED DEPOSITS, CHARGES AND FEES

All registration fees and charges are due and payable in full before or at the beginning of registration for each semester. Payments made by mail must be postmarked not later than August 9 for the fall semester, and December 13 for the spring semester.

ALL PAYMENTS MUST BE MADE BY CERTIFIED CHECK BANK DRAFT, MONEY ORDER, OR CASH. Mastercard and Visa are also accepted. Personal Checks will not be accepted. Checks, drafts, and money orders must be made payable to North Carolina A&T State University, and sent directly to:

Treasurer's Office
Dowdy Administration Building
North Carolina A&T State University
Greensboro, NC 27411

**PLEASE DO NOT SEND CASH PAYMENTS BY MAIL!
A \$25 NON-REFUNDABLE APPLICATION FEE IS REQUIRED
OF ALL APPLICANTS.**

HOUSING DEPOSIT

A housing deposit of \$75 is required of all students who plan to live on campus and is to be paid in the following manner:

1. A continuing student who obtains a valid Housing Random Selection Process (RSP) (lottery) Number must pay the deposit within two weeks after RSP Numbers are announced. Effective Fall 1992, students who plan to occupy student housing must confirm their intentions by paying the entire registration bill on or before August 9, 1995. New entering freshman/new students are excluded from this policy.

This new policy requires that new registration charges as well as previous account balances be paid in full by cash, cashier's check, visa or master card, or through financial aid or promissory note.

Otherwise, they are ineligible for on-campus housing unless vacancies occur. Unused valid RSP Numbers are given to the next higher RSP Numbers until students report to the Halls for beginning of the semester.

2. All new freshmen, transfers and first time resident students shall pay by May 1 for the fall semester and by October 30 for the spring semester or until all allotted spaces have been assigned.
3. If the student does not plan to utilize the assigned on-campus housing, a written cancellation notice must be submitted to the Office of Housing and Residence Life according to the following schedule or be charged for the entire semester plus handling fees as set forth in the housing contract.
 - (a) On or before July 17 for the fall semester.
 - (b) On or before December 4 for the spring semester. If housing is not available for the student, deposit will be returned.
4. If the student utilizes campus housing, the housing deposit will be applied to his/her account for the spring semester. If the deposit is paid in the spring for the spring semester, the student must apply for a refund in the Treasurer's Office, Suite 112, of the Dowdy Administration Building.

Charge Category — DAY STUDENT (Student Living Off Campus). **Payment** — Each Semester. **Residence Status** — **In-State** — \$715.50. **Out-of-State** — \$3,957.50. **Charge Category** — BOARDING ONLY STUDENT (Student Living Off Campus but taking meals on campus). **Payment** — Each Semester. **Residence Status** — **In-State** — \$1,381.50. **Out-of-State** — \$4,622.50. **Charge Category** — BOARDING AND LODGING STUDENT (Student Living On Campus. NOTE: All Dormitory Students must take meals in the University Dining Hall and participate in the student accident insurance program, however, the cost of this insurance is covered by our current lodging fee. **Payment** — Each Semester. **Residence Status** — **In-State** — \$2,280.50. **Out-of-State** — \$5,522.50

MAILBOX KEY DEPOSIT

The centralized Mail Center houses mailboxes for all lodging students. Box numbers are assigned and are retained during the length of time students reside in residence halls. No fee is charged for this service; however, a key deposit of \$10 is required and is refundable when the key is returned at the end of the enrollment period or upon withdrawal from Campus housing. This \$10 mailbox key deposit is included in the fee schedule for lodging students.

REGULAR SESSION CHARGES FOR PART-TIME STUDENTS NORTH CAROLINA STUDENT RATES

No. of Hrs.	Tuition	Other Required Fees	Total
1-5	\$ 96.00	\$ 59.13	\$155.13
6-8	\$191.00	\$215.50	\$406.50
9-11	\$287.00	\$333.50	\$620.50
12 or more	\$382.00	\$333.50	\$715.50

OUT-OF-STATE STUDENT RATES

No. of Hrs.	Tuition	Other Required Fees	Total
1-5	\$ 906.00	\$ 59.13	\$ 965.13
6-8	\$1,812.00	\$215.50	\$2,027.50
9-11	\$2,718.00	\$333.50	\$3,051.50
12 or more	\$3,624.00	\$333.50	\$3,957.50

(Boarding and Lodging Per Semester) — \$1,565.00

INCIDENTAL FEES, DEPOSITS, AND CHARGES:

Accident Insurance (Optional)	\$55.00	Motor Vehicle Registration — Regular Student	60.00
Activity Sticker Replacement Fee		Practice Teaching, Practicum Internship	60.00
Cost of Remaining Athletic Events		Regalia Fee — Graduate	30.00
Application Fee (Non-Refundable) No Credit on Account	25.00	Regalia Fee — Undergraduate	15.00
		ROTC Uniform Deposit-	15.00
Bowling Course Fee	11.00	Air Force (Refundable)	15.00
Chemistry Laboratory Breakage Fee	5.00	ROTC Uniform Deposit-Army (Refundable)	10.00
Breakage Deposit (Refundable)	10.00	Room Deposit (Escrow)	75.00
Cooperative Education Adm. Fee	30.00	Parking Fee Violations	2.00-25.00
Diploma — Graduate	15.00	Transcript Fee	2.00
Diploma — Undergraduate	10.00	USAID Sponsored Student Adm. Fee Per Semester	200.00

Identification Card Replacement Fee	10.00	Visiting Auditor Course Fee	25.00
Key Replacement Fee	10.00	Orientation Fee — Freshmen & Transfer Students	10.00
Late Registration Fee	20.00	Mail Box Key Deposit (refundable)	10.00
Master's Thesis Binding Fee	25.00		
Meal Card Replacement Fee	10.00		
Motor Vehicle Registration — Evening Student	30.00		

TWENTY-FIVE PERCENT (25%) TUITION SURCHARGE

The 1993 Regular Session of the General Assembly enacted a special provision directing the Board of Governors to impose a 25% tuition surcharge on students who take more than 140 degree credit hours to complete a baccalaureate degree in a four year program or more than 110% of the credit hours necessary to complete a baccalaureate degree in any program officially designated by the Board as a five-year program. Effective with the fall 1994 semester, all new undergraduates seeking a baccalaureate degree at North Carolina A&T State University is subject to this tuition surcharge. The surcharge cannot be waived for out-of-state students and does not apply to required fees. The calculation of these credit hours taken at the University or transferred from a constituent institution of the University of North Carolina shall exclude hours earned through the College Board's Advanced Placement or CLEP examinations, through institutional advanced placement or course validation, through summer term or extension programs, or excess hours taken during 8 semesters for a four year or excess hours taken during 10 semesters for a five year program.

AUDIT OF COURSES

Course auditing is available to any student upon payment of all applicable fees. Full-time students may audit courses without additional charges. Students auditing courses are not required to participate in class discussion, prepare assignments, or take examinations. **COURSE AUDITING IS WITHOUT CREDIT.**

REGISTRATION FOR THESIS ONLY WITH ZERO CREDIT

Students who have completed all of their course work and have already registered for the total number of credit hours provided for the thesis in a previous semester are required to register for "thesis only, with zero credit," if they need to be at the University to complete their thesis or to engage in a research project.

Tuition charge for the 1995-96 year for an in-state graduate student registered for thesis only with zero credit is \$161.00. The charge for an out-of-state graduate student is \$566.00.

Students are not permitted to use the facilities of the University without being officially registered.

REFUND POLICY

Refunds of tuition and related fees upon official withdrawal from the University will be made according to the following schedule: Refer to Student Financial Aid Handbook for refund policy for first time student receiving federal financial aid (Title IV).

IF WITHDRAWAL IS WITHIN THE FOLLOWING WEEKS OF CLASSES

1 Week	90%	4 Weeks	40%
2 Weeks	80%	5 Weeks	20%
3 Weeks	60%	After 5 Weeks	No refund

Board refunds are prorated for the remaining days in the Semester based on the Monday following withdrawal.

WITHDRAWAL FROM COURSES

In order to receive financial credit for withdrawal from courses, a student must withdraw from course(s) within the official "add" period.

THE UNIVERSITY RESERVES THE RIGHT TO INCREASE OR DECREASE ALL FEES AND CHARGES, AS WELL AS ADD OR DELETE ITEMS OF EXPENSE WITHOUT ADVANCE NOTICE AS CIRCUMSTANCES IN THE JUDGMENT OF THE ADMINISTRATION MAY REQUIRE.

SUMMER SCHOOL CHARGES PER CREDIT HOUR - IN-STATE UNDERGRADUATE

No. of Credit Hrs.	Tuition	Other Required Fees	Total
1	\$101.00	\$41.00	\$142.00
2	\$101.00	\$42.00	\$143.00
3	\$101.00	\$43.00	\$144.00
4	\$101.00	\$48.00	\$149.00
5	\$101.00	\$53.00	\$154.00
6	\$205.00	\$60.00	\$265.00
7	\$205.00	\$65.00	\$270.00
8	\$205.00	\$70.00	\$275.00
9	\$292.00	\$90.00	\$382.00
10	\$292.00	\$90.00	\$382.00
11	\$292.00	\$90.00	\$382.00
12 or more	\$380.00	\$90.00	\$470.00

OUT-OF-STATE — UNDERGRADUATE

No. of Credit Hrs.	Tuition	Other Required Fees	Total
1	\$ 921.00	\$41.00	\$962.00
2	\$ 921.00	\$42.00	\$963.00
3	\$ 921.00	\$43.00	\$964.00
4	\$ 921.00	\$48.00	\$969.00
5	\$ 921.00	\$53.00	\$974.00
6	\$1,840.00	\$60.00	\$1,900.00
7	\$1,840.00	\$65.00	\$1,905.00
8	\$1,840.00	\$70.00	\$1,910.00
9	\$2,734.00	\$90.00	\$2,824.00
10	\$2,734.00	\$90.00	\$2,824.00
11	\$2,734.00	\$90.00	\$2,824.00
12 or more	\$3,623.00	\$90.00	\$3,713.00

IN-STATE GRADUATE

No. of Credit Hrs.	Tuition	Other Required Fees	Total
1	\$101.00	\$41.00	\$142.00
2	\$101.00	\$42.00	\$143.00
3	\$205.00	\$43.00	\$248.00
4	\$205.00	\$48.00	\$253.00
5	\$205.00	\$53.00	\$258.00
6	\$292.00	\$60.00	\$352.00
7	\$292.00	\$65.00	\$357.00
8	\$292.00	\$70.00	\$362.00
9	\$380.00	\$90.00	\$470.00
10	\$380.00	\$90.00	\$470.00
11	\$380.00	\$90.00	\$470.00
12 or more	\$380.00	\$90.00	\$470.00

OUT-OF-STATE — GRADUATE

No. of Credit Hrs.	Tuition	Other Required Fees	Total
1	\$ 921.00	\$41.00	\$962.00
2	\$ 921.00	\$42.00	\$963.00
3	\$1,840.00	\$43.00	\$1,883.00
4	\$1,840.00	\$48.00	\$1,888.00
5	\$1,840.00	\$53.00	\$1,893.00
6	\$2,734.00	\$60.00	\$2,794.00
7	\$2,734.00	\$65.00	\$2,799.00
8	\$2,734.00	\$70.00	\$2,804.00
9	\$3,623.00	\$90.00	\$3,713.00
10	\$3,623.00	\$90.00	\$3,713.00
11	\$3,623.00	\$90.00	\$3,713.00
12 or more	\$3,623.00	\$90.00	\$3,713.00
Boarding and Lodging — (Gamble Hall) Per Week			\$111.40
Boarding and Lodging (All other Residence Halls) Per Week			\$85.80

DETAILS OF FEES, DEPOSITS AND CHARGES

	Per Semester	Per Year
Required Fees - N.C. Student Tuition		
Tuition	<u>\$ 382.00</u>	<u>\$ 764.00</u>
Other Required Fees	<u>\$ 333.50</u>	<u>\$ 667.00</u>
Total — N.C. Day Student	<u>\$ 715.50</u>	<u>\$ 1,431.00</u>
Boarding and Lodging		
Board and Lodging	\$1,520.00	\$ 3,040.00
Reserve for Construction and/or Renovation of Dormitories	\$ 35.00	\$ 70.00
Mail Box Key (refundable)	<u>\$ 10.00</u>	<u>\$ 10.00</u>
Total Boarding and Lodging	<u>\$1,565.00</u>	<u>\$ 3,120.00</u>
Total N.C. Boarding and Lodging Student	<u>\$2,280.50</u>	<u>\$ 5,522.50</u>
Out-of-State Student Tuition	\$3,624.00	\$ 7,248.00
Other Required Fees	<u>\$ 333.50</u>	<u>\$ 667.00</u>
Total Out-Of-State Student	\$3,957.50	\$ 7,915.00
Boarding and Lodging	\$1,565.00	\$ 3,120.00
Total Out-of-State Boarding and Lodging	<u>\$5,522.50</u>	<u>\$11,035.00</u>

STUDENT FINANCIAL AID

Through the student financial aid program, the University makes every effort to assure that no qualified student will be denied the opportunity to attend because of a lack of funds. Students who demonstrate financial need and have the potential for success in the University may obtain assistance to meet their expenses depending upon funds available. Financial aid is awarded without regard to a student's race, religion, color, national origin, or sex. The University provides financial aid for students from four basic sources: grants, scholarships, loans, and employment.

The University student aid funds are administered in conjunction with a nationally established policy and philosophy of financial aid for education. The basis of this philosophy is the belief that parents are the primary and responsible resource for helping to meet educational costs, and student financial aid is available for filling the gap between the student's resources and expenses.

The amount of the contribution expected from parents is related to consideration of a family's financial strength, net income, number of dependents, allowable expenses and indebtedness, and assets. Procedures established by a central needs analysis system and approved by the federal government are used in making this evaluation.

The University utilizes the "packaging concept" of financial aid. Students with great need may expect assistance through a variety of sources which may include loans, employment, scholarship and/or grants.

Typical Sources of Financial Aid

Federal Perkins Loan

Federal Pell Grant

Federal Supplemental Educational Opportunity Grant (SEOG)

Federal Work-Study Programs

State Need-Based Grant

National Alumni Scholarship

Departmental Scholarships

Minority Presence Grant

Donated Scholarships

Institutional Scholarship Programs

Federal Direct Student Loan

Federal Direct Parent Loans to Undergraduate Students (PLUS)

A student who wishes to be considered for financial assistance must complete the following steps:

1. Submit a Free Application for Federal Student Aid to the Federal processor.
2. Submit copies of Income Information if selected for verification, or other documents if required.

A student who completes the Free Application for Federal Student Aid will be considered for all financial assistance at the University for which he/she is eligible, including general scholarships, grants, loans, and Federal Work-Study.

The priority deadline to have your completed application on file in the Student Financial Aid Office in order to receive consideration for assistance has been established as follows:

For any award year, the priority filing deadline is March 15. Students must re-apply each year; financial aid is not an automatic process. Separate applications must be filed for Summer Sessions.

Entering Students: A student entering the University as a freshman, transfer, graduate, or former student should apply for financial aid at the same time he/she applies for admission. A financial aid award will not be made until a student is admitted to the University. Therefore it is important that the admission procedure be completed as soon as possible. Any student who is admitted to the University as a "Special Student" or "Non-Degree Intent" student is not eligible to receive financial assistance. The student must petition the Director of Admissions to have his/her status reviewed and changed, if applicable.

Transfer and Graduate Students. A student who has previously attended another post-secondary school, college or university must submit a Financial Aid Transcript to document his/her financial aid status at the previous school. A separate transcript must be completed for each school previously attended.

Graduate Students. A graduate student who applies for financial aid is eligible to be considered only for loan assistance and for campus employment. Information about graduate assistantships may be obtained from the Graduate School Office. To be considered for financial assistance, a graduate student can not be admitted under any "special circumstances" and must maintain a 3.0 or better cumulative grade point average to remain eligible for loans. Graduate students must submit Financial Aid Transcripts from all schools previously attended.

All applicants must re-apply for financial assistance each academic year and separately for a summer session.

Information About Other Programs of Financial Aid

A student is encouraged to apply for sources external the University. An award from external sources must be reported to the Student Financial Aid Office so that it may be included as a part of the student's total aid. A student may be eligible for assistance from the following internal and external programs:

1. *North Carolina Student Incentive Grants.* Grant funds are available to North Carolina residents who are full-time, undergraduate students and who have substantial financial need. The NCSIG program is administered by College Foundation Inc. For more information call College Foundation, Inc. at (919) 821-4771. The deadline is March 15.
2. *Vocational Rehabilitation.* Grants may be provided to needy students who are physically handicapped. A North Carolina student should contact the Vocational Rehabilitation Division of the Department of Human Resources in Raleigh.
3. *North Carolina Prospective Teachers' Scholarship-Loan.* The Department of Public Instruction in Raleigh administers a program of assistance to North Carolina students who plan a teaching career in the public schools of North Carolina.
4. *North Carolina Veterans' Scholarship.* The children of deceased or disabled veterans or of veterans who were listed as POW/MIA may be eligible for scholarships from the North Carolina Division of Veterans' Affairs, Raleigh.
5. *North Carolina Commission for the Blind* Grants may be provided to needy students who are physically handicapped. A North Carolina student should contact the North Carolina Department of Human Resources, Division of Services for the Blind in Raleigh.

6. *North Carolina Medical Care Commission.* A student may get information about the program by writing to the Department of Human Resources, Division of Facility Services, P.O. Box 12200, Raleigh, NC 27605.
7. *Cooperative Educational Program.* The Cooperative Education Program operates under two plans, Precooperative Education and Cooperative Education. After the freshman year, the student alternates semesters of full-time study with semesters of full-time related work experience. The students are paid by the sponsoring employer during the work experiences. Both plans are counseling-centered and the objectives are to enrich the total educational experiences of the students involved.
8. *ROTC Scholarships.* AFROTC/AROTC Scholarships for four (4), three-and-a-half (3 1/2), three (3), two-and-a-half (2 1/2), and two (2) years may be available, based on Air Force/Army Officer accession needs, to men and women in selected engineering fields, selected scientific fields, selected non-technical academic majors, Navigator/Missile Launch Officer (for last 3H, 3, 2 1/2, or 2 years of a Bachelors Degree), pre-health professions (only for last 2 or 3 years of a Bachelors Degree), premedicine (Physician/Osteopath only), and nursing (only for last 2 years of a Bachelors Degree in Nursing).
9. *Minority Presence Grant Program — General Program.* The University will continue to fund the Minority Presence Grant Program — General Program, Part I and Part II. The University will allocate this money to historically white and historically black institutions to aid them in recruiting financially needy North Carolina Students who would be minority presence students at the respective institutions by enabling the institutions to offer relatively more aid for minority presence students in the form of grants rather than loans. General Program Part I includes funds for minority presence grants for students attending the North Carolina Central University School of Law. General Program Part II consists of grant funds for Native Americans, Hispanics, and Asians.
10. *The Quiester Craig Scholarship Fund.* An anonymous benefactor endowed this fund to provide academic scholarships for students majoring in Accounting. Named in honor of the School Dean, Dr. Quiester Craig, the recipients are determined by the Dean of the School of Business and Economics in consultation with the Chairman of the Accounting Department.
11. *The Nationwide Insurance Scholarship.* Established for academically qualified students in the School of Business & Economics with preference given to students with a demonstrated interest in insurance. Recipients must show evidence of leadership in a campus/community role.
12. *The James A. Ruffin Memorial Award.* Established by his sister, Pauline R. Thornton, and identified with The Queens (Long Island) Alumni Association, Inc. of New York, this annual award of \$500 is restricted for a student from Eastern North Carolina. The award is based on need, academic average, and other eligibility criteria for a student majoring in Accounting or Business Administration.
13. *Special Engineering Grants and Scholarships.* Students admitted to Engineering Majors are reviewed as part of the admissions process for eligibility for several scholarship programs. Criteria include a high school record of distinction. These programs are supported by the National Action Council for Minorities in Engineering, Inc. (NACME), and R. J. Reynolds Company, and others. In addition, a variety of Corporations support scholarship and Co-op programs, internships, and summer employment opportunities for engineering students who have attained outstanding scholastic records during their freshman or sophomore years and who have met other program-specific criteria.

14. *American Indian Student Legislative Grant Program*: Students must be admitted or enrolled in a regular degree granting program at the University; be classified as a North Carolina resident for tuition purposes- have financial need-be a member of an Indian tribe recognized by the state of North Carolina or by the Federal government. \$500 maximum per academic year for full-time undergraduate students and a reduced amount proportional to academic load for part-time students. Awards may be renewed annually, provided the student has need and remains in good standing academically. Applications are available in the Financial Aid Office.
15. *The Paul Douglas Teacher Scholarship Program*: Recipients must be a United States citizen admitted to enroll or enrolled in an eligible program leading to a degree. Students must have ranked in top 10% of the high school graduating class and have a cumulative GPA of 3.0 on a 4.0 grade scale. An outstanding record of leadership on service in extracurricular activities is a prerequisite. Student must express an interest in becoming a teacher at the pre-school, elementary, or secondary level, especially in North Carolina. Awards are valued at up to \$5,000 per year, but may not exceed the cost of education and must be reduced if other financial aid under Title IV of the Higher Education Act of 1965, as amended, is received. Subject to Congressional appropriations, the awards may be renewed, provided the recipient continues to meet the requirements of the scholarship. Applications may be obtained in the spring of each year from the office of the Dean of Education.
16. *The C.M. and M.D. Suther Scholarship Program*. The award is available to a full-time North Carolina resident undergraduate who has a financial need. The student must be enrolled. The scholarship can be made either to a freshman who was in the top 25% of his/her high school graduating class or to an upper-class student with an academic average of at least a B. Only one award is made each year, and is nonrenewable. The recipient is chosen by the financial aid Director.
17. *The North Carolina Teaching Fellows Scholarship Program*: Applicants are chosen on the basis of high school grades class standing, SAT scores, writing samples, community service, extracurricular activities, and references from teachers and members of the community. Recipients must be accepted for admission to the University. Applicants are screened by two committees one from the applicant's local school district, and the other from the educational region in which the applicant lives. Candidates recommended by the selection committees are interviewed by the Regional Screening Committees. Recipients of Teaching Fellows Awards are named in May of each year. Financial need is not a selection criterion. The amount of the award is \$5,000 per year and is renewable for four years of college. In addition, awards in the amount of \$4,000 are made to college juniors who are interested in preparing to teach in the public schools of the State. Applications are available from the North Carolina Teaching Fellows Commission, 117 Glenwood Avenue, Raleigh, NC 27603 (919/832-1584).
18. *Ronald McNair Scholarships*: Ronald McNair Scholarships are offered to disadvantaged students entering the fields of physics or engineering. High school students are invited to apply for these scholarships as incoming freshmen with a deadline of April 1. Minimum requirements for incoming freshmen will include:
 1. High school grade point average (GPA) of 2.5 on a 4.0 scale.
 2. Two letters of recommendation, one of which must be from a mathematics or science teacher. Scholarships may be renewed each year if the following requirements are met:

1. A scholar must carry a minimum load of 12 credits per semester.
2. A scholar must maintain a 2.5 overall GPA.

Scholars may also be selected from majors enrolled in physics or engineering at North Carolina Agriculture and Technical State University. Minimum requirements for enrolled majors for selection as McNair Scholars will be:

1. A minimum load of 12 credits per semester.
2. A minimum GPA of 2.5.
3. Two letters of recommendation from North Carolina Agricultural and Technical State University faculty.

The selection of scholars will be handled by the College of Arts and Sciences for physics scholarships and by the School of Engineering for engineering scholarships.

19. *North Carolina Student Loan Program for Health, Science, and Mathematics*: Legal residents of North Carolina accepted as full-time students in accredited baccalaureate or master's programs leading to a degree are eligible for this program. Studies must be in Health (Allied Health, Health Sciences, Clinical Psychology, Medical Social Work), Mathematics (General, Pure and Applied Mathematics, Statistics, Actuarial Science), and Science (Agricultural Sciences, Renewable Natural Resources, Computer and Information Sciences, Engineering and Engineering Related Technologies, Life Sciences, Physical Sciences, Food Sciences and Human Nutrition, Dietetics/ Human Nutritional Services). Recipients are selected according to interests, academic capabilities, motivation and financial need. Maximum loans range from \$2,500 to \$6,000 a year depending on the degree level. Loans are renewable annually on satisfactory academic progress. Students should request information and applications between December 1 and April 1 from the North Carolina Student Loan Program for Health, Science, and Mathematics, 116 West Jones Street, Raleigh, NC 27603-8003, (919/733-2164).
20. *Sigmund Sternberger Scholarships*: Sigmund Sternberger Scholarships are available to assist Guilford County students in attending the University. These awards are made to students who have the character, integrity, ability and desire to make a contribution to the community, but who are prevented from developing their full potential because, due to no fault of their own, they lack economic resources with which to develop their skills to do so.
21. *James G. McClure Educational and Development Fund Scholarships*: The James G. McClure Educational Fund awards two or three scholarships to entering students who are residents of one of twenty-two counties in North Carolina mountain areas. Applicants are recommended to the Scholarship Committee based on their high school record for both scholarship and leadership; evidence of Christian character, financial need, intellectual promise and demonstrated ambition.
22. *Dr. A. P. and Frances Dickson Scholarships*: A. P. Dickson Scholarship is awarded annually to a full-time undergraduate student who currently resides in Hoke County, North Carolina. Recipients are chosen by the financial aid office on the basis of academic standing and financial need. Awards are nonrenewable and vary in amount according to income available from the Trust.
23. *James Lee Love Scholarship*: A Love Scholarship is awarded annually to a full-time North Carolina resident undergraduate student. Recipients are chosen by the Financial Aid Office on the basis of academic standing and financial need. Awards are nonrenewable and vary in amount according to income available from the Trust.

24. *Donald E. Robinson Memorial Scholarship*: Scholarships are available for high ability graduates with financial need from Cummings High School in Burlington, North Carolina. These awards are renewable in successive years.
25. *Chancellor Incentive Scholarship*: The Chancellor's Incentive Grant is available to first time freshmen who are residents of North Carolina and who have demonstrated outstanding scholastic achievement, intellect and leadership abilities. Applications may be obtained from the Admission's Office.

Selection Criteria: Applicants will be evaluated on the basis of academic record, test profiles, scholastic achievement, evidence of extracurricular involvement and significant leadership skills. If you are selected, you will be notified by the Office of Admissions.
26. *North Carolina A & T State National Alumni Scholarship*: The North Carolina A&T State University National Alumni Scholarship is a four year scholarship. Applicants are selected based upon nominations from the local alumni chapters. The alumni chapters distribute the applications and other criteria to the area high schools.

To be considered for the scholarship, the applicant must have a 3.0 cumulative grade point average and a minimum SAT score of 1,000. The filing deadline for the scholarship application is February 1.

In state students who are selected will receive a full scholarship based on the charges for tuition, fees, room and board. Out of State students who are selected will receive a partial scholarship based on one-half of the charges for tuition, fees, room and board.

The recipient must maintain at least a 3.0 CGPA in order to receive the scholarship each academic year.

For further information, please contact the University Alumni Affairs Office or the local A&T Alumni Chapter.
27. *North Carolina Rehabilitation Corporation Student Loan Program*: Loans under this program are available to needy and worthy North Carolina farm males/females who plan to study agriculture or home economics. The loans bear interest at the rate of (4%) percent per annum. Application forms and additional information may be obtained from North Carolina Rural Rehabilitation Corporation, P.O. Box 2403, Raleigh, NC.
28. *Chancellor's Academic Scholarship*: The Chancellor's Academic scholarship is intended to give needed aid to well-prepared students who want to attend North Carolina A&T State University. The scholarships are limited to a maximum award of \$3,000 per recipient per academic year. Each award will be reduced by the amount of need-based aid that the Academic Scholar receives from the following programs: Federal Pell, NCSIG, or FSEOG. Awards are available to entering first-time freshmen and entering first-time transfer students from North Carolina Community Colleges, and will be renewable semester-by-semester as long as the recipient meets all applicable criteria.
 1. To be eligible for an Academic Scholarship as an entering freshmen, a student must meet the following requirements:
 - a. be a graduate of a high school in North Carolina (students from all counties are eligible for this scholarship program);
 - b. rank in the top half of his or her class upon high school graduation, and meet all other university admissions requirements;
 - c. apply for need-based student financial aid;

- d. agree to perform at least six hours per week in public service, either at the University or in the community, as a freshman, and eight hours per week as a sophomore, junior or senior;
 - e. complete at least 15 semester hours each regular semester;
 - f. earn a Grade Point Average (GPA) in course-work taken at the awarding institution according to the following schedule:
 - maintain in the freshmen year – 2.6 or higher
 - maintain in the sophomore year – 2.8 or higher
 - maintain in the junior year – 3.0 or higher
 - g. reflect in personal and scholastic behavior high moral and ethical standards.
2. To be eligible for an Academic Scholarship, a transfer student must meet the following requirements:
- a. be a resident of North Carolina and possess the Associate of Arts (AA), the Associate of Science (AS), the Associate of Fine Arts (AFA), or a certificate or degree in a program that articulates directly with an academic degree program offered by Fayetteville State University, North Carolina A&T State University, North Carolina Central University, Pembroke State University, and Winston-Salem State University from a North Carolina Community College and meet all University admission requirements; Must have an articulation agreement.
 - b. have a cumulative GPA of at least 2.5 if the student enters with an associate degree, or a 2.0 if the student enters after completion of a certificate program;
 - c. apply for need-based student financial aid;
 - d. agree to perform at least eight hours per week in public service at the University or in the community;
 - e. complete at least 15 semester hours each regular semester;
 - f. maintain a 3.0 grade point average at the University if the student enters with an Associate degree, or
 - maintain in the freshmen year – 2.6 or higher
 - maintain in the sophomore year – 2.8 or higher
 - maintain in the junior year – 3.0 or higher
 - g. reflect in personal and scholastic behavior, high moral and ethical standards

Eligible applicants are identified by the Director of Financial Aid and final award selection is determined by the School Deans.

Satisfactory Academic Progress

The Higher Education Act requires that a student must be maintaining satisfactory academic progress in a course of study leading towards a degree in order to be eligible for financial assistance.

To be considered making satisfactory academic progress, a *full-time* student must have declared a major course of study, leading towards a degree by the end of the third (3rd) semester. The grade point average and semester hours passed indicated below must be reached by the end of each semester:

Semester	Minimum Cumulative Grade Point Average	Minimum Hours Completed
1	1.7	12
2	1.8	24
3	1.9	36
4	2.0	48
5	2.0	60
6	2.0	72
7	2.0	84
8	2.0	96
9	2.0	108
10	2.0	120

A part-time undergraduate student enrolled in a degree program must maintain the following minimum cumulative grade point average at the *END* of the cumulative semester hours indicated:

Semester Hours Cumulative Grade Point Average

24	1.8
48	2.0
72	2.0
96	2.0

A part-time undergraduate student is defined as one who enrolls in less than twelve (12) hours during a semester.

Full-time and part-time students who enroll in the University after an academic suspension must achieve a minimum semester grade point average of 2.0 and complete 12 credit hours in order to be reconsidered for financial aid.

Failure to meet the minimum academic requirements given above renders the student ineligible to receive financial assistance and subject to immediate academic suspension. A student who is suspended for a given semester is not eligible to receive any financial assistance until the student has been reinstated to a satisfactory academic progress level.

Beginning with the 1987-88 award year, students who have not received Title IV assistance in previous award years must have a cumulative grade point average of 2.0 ("C") and completed at least 48 hours at the end of four (4) semesters. This requirement may be waived if the student has undergone undue hardship because of death of a relative of the student, an injury or illness of the student, or other special circumstances as determined by the Financial Aid Administrator. Students must provide documentation to support the waiver.

Refer to Student Financial Aid Handbook for additional information.

ADMISSIONS

POLICY

North Carolina Agricultural and Technical State University is an equal opportunity institution committed to the principle that access to study be afforded on the basis of individual merit and without regard to race, religion, national origin or handicap. Unless otherwise specified, admission to all undergraduate curricula are under the jurisdiction of the Director of Admissions.

PROCEDURES

Submission of Application

Inquiries on and applications for admissions should be made to the Office of Admissions, North Carolina Agricultural and Technical State University, Greensboro, North Carolina 27411. A non-refundable fee of \$25.00 is required with each application. The university does not accept fee waivers.

Application Deadline

The recommended deadlines for submitting the application for admission is June 1 for the Fall Semester and December 1 for the Spring Semester. Applications received after these dates will be honored on a day-to-day basis as long as classroom space is available. Applications for early decision must be received by November 1 prior to Fall Semester of intended enrollment. In all cases, early application is encouraged because class space and housing facilities dictate to some extent the number of new students that can be admitted for each semester.

International students on non immigrant VISA's are required to submit the application by May 1 for Fall Semester and November 1 for the Spring Semester.

Supporting Documentation

1. To be considered official, all transcripts from high school and/or college must be sent directly to the Office of admissions from the sending institutions.
2. SAT or ACT scores, when applicable, must be official and reports sent directly from the testing agency. The University's CEEB code for the SAT report is 5003; the code for the ACT report is 3060.
3. The submission of a final or complete transcript from the last school attended is the responsibility of the student. Thus the University reserves the right to withdraw any offer of admission if the applicant fails to satisfy all requirements prior to the beginning of the first semester of enrollment. Students enrolled in classes that have not fulfilled admission requirements will be withdrawn from classes by the university.

Notice of Admission and Confirmation

The University practices "rolling admission"; therefore, decisions are made as soon as a file is complete. Early decision notices are mailed between December 1 and December 15. Candidates who are offered admission must notify the University of their intent to enroll by January 15. Students approved for admissions are forwarded a certification of admission. The candidate reply date of May 1 for freshmen student for each fall term is honored by the University. Transfer students should confirm within two weeks of the receipt of the admission letter. Failure to comply will affect adversely the candidate's reserved space. Persons who are not approved for admission will also be notified in normal fashion.

Prior to registration for each semester, the final high school transcript showing the date of graduation must have been received for all new freshmen and the final college transcript

must have been received for all transfer students. In addition, the Medical Health Form must be completed by your physician and returned along with a copy of your Immunization Record to the Director of Health Services. North Carolina law requires the University to suspend students who have not satisfied immunization requirements within 30 days from the beginning of classes for that semester. An immunization record copy from your high school is acceptable.

ADMISSIONS CRITERIA

Freshman Applicant

An applicant for admission is considered individually, in accordance with the following criteria:

1. Evidence of academic achievement and promise with considerable facility in the use of the English language and with an understanding of the fundamental mathematical processes.
2. Complete record from an accredited secondary or preparatory school with graduation based on no fewer than 16 units (see subject matter requirements in next section).
3. Satisfactory scores on the Scholastic Aptitude Test or the American College Test.
4. Satisfactory class rank or grade point average.

These criteria and those which follow are applied flexibly to assure that people with unusual qualification are not rejected in the admissions process. However, admission to the University is selective for out-of-state students. The University of North Carolina System has mandated that no more than 18 percent of the freshman class can be from out-of-state. Therefore academic achievement and SAT/ACT scores must be competitive.

Minimum Undergraduate Admissions Requirements

For admission to all undergraduate programs, the applicant must present sixteen (16) units of high school credit in the following academic fields.

English	4 units	Science	3 units (3)
Mathematics	3 units (1)	Electives	4 units (4)
Social Sciences	2 units (2)		

- (1) All students must present Algebra I, Geometry and Algebra II. Students who plan to major in Engineering, Mathematics, Chemistry and Physics must present an additional unit beyond Algebra II e.g., Trigonometry, Math Analysis, etc.
- (2) United States History is required.
- (3) A biological science, a physical science and a science with a laboratory are required.
- (4) No more than 2 units in vocational subjects and 2 units in the disciplines of Music and Physical Education.

In addition to the above listed criteria, the minimum standards governing admission to the School of Nursing are as follows:

- 1) a combined Scholastic Aptitude Test score of 750 or higher, and
- 2) a cumulative grade point average of "B" or better.

These requirements are the Minimum Admissions Requirements for all sixteen campuses of the UNC System. Some academic schools and majors in the College of Arts and Science have higher standards. For the class of 1990 and beyond, the following courses will be required for admission, in addition to an institution's own specific requirements:

In English, four course units emphasizing grammar, composition and literature; In mathematics, three course units including algebra I, algebra II, and geometry, or a higher level mathematics course for which algebra II is a prerequisite:

In science, three course units including - at least one unit in a life or biological science (for example, biology) - at least one unit in a physical science (for example, physical science, chemistry, physics), and at least one laboratory course; and

In social studies, two course units including one unit in U.S. history, but an applicant who does not have the unit in U. S. history may be admitted on the condition that at least three semester hours in that subject will be passed by the end of the sophomore year.

In addition, it is recommended that prospective students complete at least two course units in one foreign language, and take one foreign language course unit and one mathematics course unit in the twelfth grade. "Course units" as defined in these requirements may include those high school level courses taken and passed by an applicant after graduating from high school, as well as those taken while enrolled as a high school student.

For specific requirements students should refer to the respective schools/college section and to departmental listings in this bulletin. However, the University reserves the right to change admission standards for schools/colleges prior to the semester the student plans to enroll.

THE UNIVERSITY OF NORTH CAROLINA

Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina A&T State University, North Carolina Central University, North Carolina School of the Arts North Carolina State University at Raleigh, Pembroke State University, University of North Carolina at Asheville, University of North Carolina at Chapel Hill, University of North Carolina at Charlotte, University of North Carolina at Greensboro, University of North Carolina at Wilmington, Western Carolina University, Winston-Salem State University.

Transfer Students

The University accepts qualified students by transfer from other accredited colleges. Applications for admission may be considered if the transfer student:

- 1) is not presently on social or academic probation at the last or current school of attendance.
- 2) has a cumulative average of at least a "C" in the institution from which transferring and is eligible to return to that institution.
- 3) has not been suspended or dropped from another institution.

Transfer students who have attended another accredited college but have earned less than twenty four (24) semester hours of specific acceptable credit must meet all freshman requirements. Transferable coursework must include six (6) semester hours in each of the following areas — English, history, mathematics, science — in order to be exempt from any high school requirements. Transfer for programs in the School of Engineering requires a 2.5 GPA if transferring from a four year institution with an accredited engineering program or 3.0 GPA if transferring from other types of institutions.

Applications from transfer students cannot be considered until all credentials are received from the high school and all other institutions previously attended. In addition, there must be a statement of good standing and honorable dismissal from these institutions. Previous college records must show a cumulative average of "C" or above. No course is accepted in transfer in which a grade below "C" was originally earned.

Accepted courses are recorded to the student's credit, but grade points are not calculated on the transferred courses. The university does not accept transfer credit from challenge examinations or for course work where grades of P/F have been given.

Transfer applicants who are not covered by the above stated policy are referred to the next section on special students.

Special Students

Special students are those who are not candidates for degree at the present time. This category includes 1) visiting students, and 2) persons who have not enrolled for one academic year and are ineligible for admissions as a transfer student. The University welcomes into this admission status enrollment of persons who are pursuing degrees elsewhere, who possess a baccalaureate degree, or who desire to earn prerequisites for graduate work. Such students may register upon the presentation of a signed statement from the appropriate official of his institution or certifying agency specifically listing and approving the courses to be taken. Such enrollment does not constitute regular admission to the University. To apply for this category of admissions, the applicant must submit the application form for admissions with fee and provide supporting documentation as appropriate. Transcripts from all colleges and universities attended are required if the applicant plans to enter degree-seeking status at a later date. Visiting students must submit a transient course study form from the home institution that has been approved by the department chairperson, school or college dean and the University Registrar. All others must provide evidence of readiness to pursue the courses desired and a statement of objective and purpose related to the request for special student admission.

Such persons may register for no more than 12 semester hours per academic term and may remain in this category until they have attempted a total of 24 semester hours.

After completing one semester of full-time study, or its equivalent, the unclassified student may petition the University's Admission and Retention Committee to be admitted to the University as a regular degree candidate on the basis of their academic accomplishments. All communications must be written and sent to the committee in care of the Director of Admissions.

International Students

North Carolina Agricultural and Technical State University welcomes and accepts application from qualified students who are not United States citizens. Such students must meet each of the following criteria:

- 1) Satisfy all requirements governing admissions for the School to which the application is made. The expected program of study from their feeder school should be university preparatory and the leaving school certificate marks must support academic promise.
- 2) Show proficiency in written and oral English usage. If English is not the first language of communication, the Test of English as a Foreign Language (TOEFL) is required and a satisfactory level of English Proficiency on both the total and part scores are required. A minimum score of 550 is required.
- 3) Can conform to all contract regulations of the United States Immigration and Naturalization Service and be eligible for F-1 Student Status as a freshman or transfer from another school.

The I-20, Certificate of Eligibility, will be prepared for all new international students who are admitted to the University and who have official documentation on file attesting to their ability to meet their school fees. The University has no financial aid for international students and permission to work is not usually granted by INS.

OTHER POLICIES AND PROCEDURES

Filing of Credentials

Applicants should take the proper steps to see that their credentials (transcripts, etc.), are sent to the Director of Admissions as early as possible, preferably not less than thirty (30) days before the beginning of the semester in which they plan to enroll.

Interviews and Campus Visits

Interviews are not required for admission, however, persons with unusual circumstances are welcome to schedule appointments to discuss these matters with an Admissions Counselor or the Director of Admissions. Campus visits are encouraged and campus tours are routinely given. Reservations for the tour are highly recommended.

Orientation, Registration and the Opening of the Semester

All newly admitted students are expected to attend Orientation and freshman students living on-campus must arrive the day preceding freshman Orientation program (See University Calendar). Orientation for transfer and special students is scheduled for the day preceding registration. Placement testing is required of all freshmen in Mathematics, English and Reading. These tests are designed as aids for academic advising and scheduling and students who fail to show proficiency in these academic areas will be assigned remedial course work. Transfer students for programs in Engineering, Mathematics, Computer Science, Animal and Plant Science, Chemistry, Physics and Biology are required to take a special mathematics test.

Permission to Take Courses Elsewhere

North Carolina Agricultural and Technical State University degree seeking students who desire to take courses elsewhere, i.e., Summer, Fall, or Spring, are required to obtain approval from their school/college dean before registering at another institution. Course descriptions are needed in order for accurate evaluations to be done. The maximum number of transferable credits is 80 semester hours (4 year programs) and course credit must be the same as that of the course at A&T. Only the credit hours will transfer to A&T and a minimum grade of "C" is required for a course to transfer. The university does not accept credit from proficiency examinations or grades of P/F. Transient Study Forms and Guidelines for off-campus study are available in the Office of Admissions.

Regulations for Veterans and Children of Deceased and Disabled Veterans

Veterans and children of deceased and disabled veterans must meet regular admission requirements. Preliminary application for any educational benefits due them should be made to the nearest regional office of the Veterans Administration well in advance of the desired admission date in order that the necessary information and documents may be obtained.

Graduate Applicants

Graduate School admission is under the supervision of the Dean of the Graduate School, North Carolina A&T State University, Greensboro, North Carolina 27411. For information concerning admission, please write the Dean of the Graduate School, North Carolina A&T State University, Greensboro, NC 27411.

Continuing Education Applicants

Summer session, the evening and weekend college and continuing education, off-campus and non-credit courses, are under the supervision of the Assistant Vice Chancellor for Academic Affairs. Information concerning admission and/or enrollment should be directed to that office. The address is:

Office of Continuing Education and
Summer Sessions
100 Dudley Building
North Carolina A&T State University
Greensboro, NC 27411

Generally admission requirements for continuing education classes are the same as those for comparable work in regular classes on campus. However, the persons may enroll without being officially admitted for non-credit courses and programs not applicable to a University degree. A continuing education applicant is usually one of matured years, with special training along particular lines or of long experience in special fields of knowledge, thus such a person can be either a degree or unclassified applicant. Continuing education enrollees who have taken compatible courses for credit may later choose to change their status to degree seeking. At the time of application for admission to degree status, the continuing education applicant is required to satisfy the standard admission policies.

RESIDENCE STATUS FOR TUITION PURPOSES

The basis for determining the appropriate tuition charge rests upon whether a student is a resident or a nonresident for tuition purposes. Each student must make a statement as to the length of his or her residence in North Carolina with assessment by the institution of that statement to be conditioned by the following.

Residence. To qualify as a resident for tuition purposes, a person must become a legal resident and remain a legal resident for at least twelve months immediately prior to classification. Thus, there is a distinction between legal residence and residence for tuition purposes. Furthermore, twelve months legal residence means more than simple abode in North Carolina. In particular it means maintaining a domicile (permanent home of indefinite duration) as opposed to "maintaining a mere temporary residence or abode incident to enrollment in an institution of higher education." The burden of establishing facts which justify classification of a student as a resident entitled to in-state tuition rates is on the applicant for such classification, who must show his or her entitlement by the preponderance (the greater part) of the residentiary information.

Initiative. Being classified a resident for tuition purposes is contingent on the student's seeking such status and providing all information that the institution may require in making the determination.

Parents' Domicile. If an individual, irrespective of age, has living parent(s) or court-appointed guardian of the person, the domicile of such parent(s) or guardian is, prima facie, the domicile of the individual; but this prima facie evidence of the individual's domicile may or may not be sustained by other information. Further, nondomiciliary status of parents is not deemed prima facie evidence of the applicant child's status if the applicant has lived (though not necessarily legally resided) in North Carolina for the five years preceding enrollment or reregistration.

Effect of Marriage. Marriage alone does not prevent a person from becoming or continuing to be a resident for tuition purposes, nor does marriage in any circumstance insure that a person will become or continue to be a resident for tuition purposes. Marriage and the legal residence of one's spouse are, however, relevant information in determining residency intent. Furthermore, if both a husband and his wife are legal residents of North Carolina and if one of them has been a legal resident longer than the other, then the longer duration may be claimed by either spouse in meeting the twelve-month requirement for in-state tuition status.

Military Personnel. A North Carolinian who serves outside the State in the armed forces does not lose North Carolina domicile simply by reason of such service. And students from the military may prove retention or establishment of residence by reference, as in other cases, to residency acts accompanied by residency intent.

In addition, a separate North Carolina statute affords tuition rate benefits to certain military personnel and their dependents even though not qualifying for the in-state tuition rate by reason of twelve months legal residence in North Carolina. Members of the armed services, while stationed in and concurrently living in North Carolina, may be charged a tuition rate lower than the out-of-state tuition rate to the extent that the total of entitlements for applicable tuition costs available from the federal government, plus certain amounts based under a statutory formula upon the in-state tuition rate, is a sum less than the out-of-state tuition rate for the pertinent enrollment. A dependent relative of a service member stationed in North Carolina is eligible to be charged the in-state tuition rate while the dependent relative is living in North Carolina with the service member and if the dependent relative has met any requirement of the Selective Service System applicable to the dependent relative. These tuition benefits may be enjoyed only if the applicable requirements for admission have been met; these benefits alone do not provide the basis for receiving those derivative benefits under the provisions of the residence classification statute reviewed elsewhere in this summary.

Grace Period. If a person (1) has been a bona fide legal resident, (2) has consequently been classified a resident for tuition purposes, and (3) has subsequently lost North Carolina legal residence while enrolled at a public institution of higher education, that person may continue to enjoy the in-state tuition rate for a grace period of twelve months measured from the date on which North Carolina legal residence was lost. If the twelve months ends during an academic term for which the person is enrolled at a State institution of higher education, the grace period extends, in addition, to the end of that term. The fact of marriage to one who continues domiciled outside North Carolina does not by itself cause loss of legal residence marking the beginning of the grace period.

Minors. Minors (persons under 18 years of age) usually have the domicile of their parents, but certain special cases are recognized by the residence classification statute in determining residence for tuition purposes.

(a) If a minor's parents live apart, the minor's domicile is deemed to be North Carolina for the time period(s) that either parent, as a North Carolina legal resident, may claim and does claim the minor as a tax dependent, even if other law or judicial act assigns the minor's domicile outside North Carolina. A minor thus deemed to be a legal resident will not, upon achieving majority before enrolling at an institution of higher education, lose North Carolina legal residence if that person (1) upon becoming an adult "acts, to the extent that the person's degree of actual emancipation permits, in a manner consistent with bona fide legal residence in North Carolina" and (2) "begins enrollment at an institution of higher education not later than the fall academic term following completion of education prerequisite to admission at such institution."

(b) If a minor has lived for five or more consecutive years with relatives (other than parents) who are domiciled in North Carolina and if the relatives have functioned during this time as if they were personal guardians, the minor will be deemed a resident for tuition purposes for an enrolled term commencing immediately after at least five years in which these circumstances have existed. If under this consideration a minor is deemed to be a resident for tuition purposes immediately prior to his or her eighteenth birthday, that person on achieving majority will be deemed a legal resident of North Carolina of at least twelve months duration. This provision acts to confer in-state tuition status even in the face of other provisions of law to the contrary; however, a person deemed a resident of twelve months duration pursuant to this provision continues to be a legal resident of the State only so long as he or she does not abandon North Carolina domicile.

Lost but Regained Domicile. If a student ceases enrollment at or graduates from an institution of higher education while classified a resident for tuition purposes and then both abandons and reacquires North Carolina domicile within a 12-month period, that person, if he or she continues to maintain the reacquired domicile into re-enrollment at an institution of higher education, may re-enroll at the in-state tuition rate without having to meet the usual twelve-month durational requirement. However, any one person may receive the benefit of the provision only once.

Change of Status. A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) must be classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual enrollment. A residence status classification once assigned (and finalized pursuant to any appeal properly taken) may be changed thereafter (with corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic year.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence status classification for tuition purposes.

ACADEMIC INFORMATION AND REGULATIONS

Each student is responsible for informing himself or herself of the academic regulations and requirements set forth in this Bulletin and for revisions of same as posted on campus bulletin boards or release in other official publications of the University. Failure to meet the requirements or comply with regulations because of lack of knowledge thereof does not excuse the student from meeting the academic regulations and requirements.

A student's program of study must be approved by his or her advisor, his or her chairperson or a member of the faculty in his or her major department at registration. Advisors will make every attempt to give effective guidance to students in academic matters and to refer students to those qualified to help them in other matters. However, the final responsibility for meeting all academic requirements for a selected program rests with the student.

ADVANCED PLACEMENT

A student entering the University from secondary school may obtain advanced placement and college credit on the basis of performance on the College Entrance Examination Board Advanced Placement examinations. A score of 3 or higher on any CEEB advanced placement examination will entitle the student to credit for the comparable University course as determined by the Director of Admissions in consultation with the Chairperson of the appropriate department.

COURSES OF STUDY

A student should refer to the requirements of his/her respective department or school about his/her program of study and confer with his/her advisor whenever problems arise. The student is expected to follow the program outlined as close as possible. This is very important during the first two years when he or she is satisfying basic degree requirements and prerequisites for advanced work.

DECLARATION OF MAJOR

A student is required to declare a major at or before completing 45 semester hours. If a major is not declared the student will not be allowed to register for the next semester.

REGISTRATION

Registration is a time designated each semester to allow the student and his or her advisor to review the student's records and plan a program for the next semester.

The student has an opportunity to discuss academic problems with the advisor. Registration helps to ensure that the courses requested on the registered schedule will be available to the student the following semester.

Any student who is enrolled in the University during the registration period is expected to register during the period designated for this purpose.

OFFICIAL REGISTRATION

In order for a student to get credit for a course, he or she must be properly registered in that course. This means that the student must have gone through the registration procedures as outlined by the University. Further, the student must have filed with the office of the Registrar the required class schedule and paid all required tuition and fees.

LATE REGISTRATION

A student is expected to complete enrollment (including the payment of all required fees) on the dates listed on the University Calendar. The payment of fees is part of the registration process. No student is eligible to attend classes until the required fees have been paid.

A student who fails to complete registration during the scheduled dates will be required to pay a late registration fee of \$20.00.

AUDITORS

A regular student may audit a course by picking up the Audit Form from the Office of the Registrar. He or she must register officially for the course and pay the University Cashier.

Attendance, preparation, and participation in the classroom discussion and laboratory exercises shall be at the discretion of the instructor.

A student who audits courses is not required to take examinations and tests and they receive no credit. An auditor may not change his or her registration from audit to credit or from credit to audit after late registration ends.

COURSE LOAD

According to Administrative Memorandum - Number 345, all full-time undergraduate students are expected to comply with the Board's 1993 Plan to Improve Graduation Rates by enrolling in an average of at least 15 semester hours per term in order to graduate in four years. The majority of North Carolina A&T State University's academic programs require a 128 semester hours. In order to complete a 128 hour degree program in 8 semesters, it will be necessary for students to carry a course load consisting of an average of 16 semester hours or complete 32 semester hours in an academic year. **Undergraduate students enrolled in 12 or more semester hours are designated as a full-time student and must pay full tuition and fees.** Full-time students usually carry from 15 to 18 semester hours. To enroll in more than 18 semester hours, students must get approval from the department head and the dean.

The maximum course load that students may carry who are on academic probation is twelve semester hours.

Undergraduate students on academic probation who have a cumulative grade point average at or above the minimum level that is required based on the number of semesters completed are exempted from the twelve hour course load limit.

DOUBLE MAJOR

Students who desire to obtain a double major, must file a double major form in the Office of the Registrar. Double major students which involves two departments or two schools must satisfy the major requirements for each department or school.

PREREQUISITES

A course which is designated as prerequisite to another course indicates that the prerequisite is required before taking the next course.

Credit may be granted to indicate acceptable performance in the prerequisite course content by successful completion of standardized tests under the College Level Examination Program (CLEP) or successfully passing an examination adopted or prepared by the department granting the credit.

REPETITION OF COURSES

A student who has received a failing grade in a required course at this University must repeat and pass the course unless the dean of the College/School authorizes a substitute course. No single course may be repeated more than (2) two times. Course withdrawals do not count. Course drops do not count toward the attempts. A course complete with a grade of "C" or higher may not be repeated for a change of grade. Special authorization may be requested, as needed, from the Dean of the appropriate College/School to assist the student with completing requirements for graduation.

When a course is being repeated, the course must be indicated on the course schedule request form.

Dual *course credit is not allowed*. For example, only three (3) hours of credit are allowed for a three (3) hour course.

All grades earned by the student are a part of his/her official academic record and will appear on his/her transcript.

CORE REQUIREMENTS OF THE UNIVERSITY

The University has approved the principle of greater flexibility in the course offerings that can be taken to satisfy the core requirements of the University. The areas in the core and the minimum semester hour requirements are as follows:

Areas	Minimum Number of Semester Hours Required	Suggested Courses
English	6	English 100, 101
Social Science	6	History 100, 101
Natural Science	6	Biological Science 100 Physical Science 100 Physics 101 Botany 140 Zoology 160 Chemistry 101, 102
Humanities	6	Humanities 200, 201
Mathematics	6	Mathematics 101, 102
Health or Physical Education	2	

Each incoming student beginning with the 1995-1996 academic year will be required to complete in order to graduate a three-hour course of African/African American Studies and a three-hour course of Global Studies. These two courses can be met through a student's general education component, major course requirements, or free electives.

"Schools and departments with internal and external constraints, for example accreditation and certification, may also meet the African/ African American and/or Global Studies requirements through a series of courses in which these issues are consistently integrated within the regular course material."

African/African American Courses

1. ENGL-333: Survey of Afro-American Literature
2. MUSI-220: History of Black Music in America
3. MUSI-221: History of Jazz
4. FOLA-417: Literature of Afro-French Expression

5. HIST-215: History of Africa Since 1800
6. HIST-216: History of Africa Since 1800
7. HIST-310: The Afro-American in the United States to 1877
8. HIST-311: The Afro-American in the United States Since 1877 (A continuation of History 310)
9. HIST-320: African History as seen Through African Art and Archaeology
10. HIST-328: U.S. Slavery, 1619-1865
11. HIST-412: Modernization in Africa from 1920 to the Present
12. HIST-416: History of Black Culture in the United States
13. POLI-220: Blacks in the American Political System
14. POLI-445: Problems of Contemporary Africa
15. SOCI-314: Black Experience
16. SPCH-302: Minorities in Mass Media

Global Studies Courses

1. AERO-501: National Security Forces in Contemporary American Society I
2. AERO-503: National Security Forces in Contemporary American Society II
3. ECON-505: International Economic Relations
4. ECON-537: International Marketing
5. FOLA-417: Literature of Afro-French Expression
6. FOLA-450: La Cultura Hispanica (Formerly Spanish 301, 2543)
7. HIST-100: World Civilizations - Part I
8. HIST-101: World Civilizations - Part II
9. HIST-210: World Regional Geography
10. HIST-320: African History as seen through African Art and Archaeology
11. HIST-321: Cultural History, Ethnicity and Ethnographic Collections
12. HIST-322: Economic Geography
13. HIST-327: History of Latin America
14. HIST-330: History of the Far East to 1800
15. HIST-331: History of the Far East to 1800
16. HIST-332: The Modern Middle East
17. HIST-412: Modernization in Africa from 1920 to the Present
18. POLI-444: International Relations
19. POLI-445: Problems of Contemporary Africa

COURSE CREDIT BY EXAMINATION

Credit may be earned by examination for any undergraduate course for which a suitable examination has been adopted or prepared by the department granting the credit. The student receives the grade "CE" and regular credit for the number of hours involved. However, the credit hours are excluded in computing the student's grade point average.

Credit may also be granted for the successful completion of standardized tests under the College Level Examination Program (CLEP), as approved for specific courses by University departments. There is no maximum amount of credit that a student may earn, but a student must complete a minimum of three semesters as a full-time student in residence at the University. Fees for CLEP and other standardized examinations are determined externally, rather than by the University. These credits are treated as transfer credits. Questions about the program may be addressed to the Director of Admissions, or the Director of Counseling Services.

(Grading System)

Grades are assigned and recorded as follows:

Grade	Description	Grade Points
A	Excellent	4
B	Good	3
C	Average	2
D	Below Average, but passing	1
F	Failure	0
I	Incomplete	
CE	Credit by examination	
AP	Advanced placement	
S	Satisfactory (non-credit courses)	
U	Unsatisfactory (non-credit courses)	
AU	Audit	
W	Withdrew	
P	Passing	

ACADEMIC RETENTION

The normal load for an undergraduate student is sixteen (16) credit hours per semester. The minimum load for a full-time undergraduate student is twelve (12) credit hours per semester. The student is expected to make normal progress toward a degree. Normal progress means the completion of sixteen or more semester hours each semester with a 2.0 grade point average or higher for a full-time student. These 16 hours must consist of courses that count toward graduation for a full-time student.

To be in good academic standing a full-time student must have the following minimum grade point average and the following semester hours passed:

<i>Semester Number</i>	<i>Grade Point Average</i>	<i>Semester Hours</i>
ONE	1.40	12
TWO	1.50	24
THREE	1.60	36
FOUR	1.80	48
FIVE	1.95	60
SIX	2.00	72
SEVEN	2.00	84
EIGHT	2.00	96

A student is eligible to register if he or she has a minimum overall grade point average of 2.0 and has attended the University less than the maximum number semesters allowed for the degree program.

A student must achieve a minimum semester grade point average of 2.0 each semester enrolled beyond the sixth (6th) semester to be in good academic standing. A student is eligible to continue to work toward an undergraduate degree until the student has attended eleven

(11) semesters as full-time student (not including summer session) or until the student has attempted 152 semester hours. At that point the student becomes ineligible to continue at the University unless approved by the dean of the college or school.

The student should be aware of his or her academic status each semester. Failure to meet the minimum academic requirements given above results in immediate suspension. A student who is suspended for a given semester may apply for re-admission for the next semester. The application for re-admission should reach the Office of the Registrar 30 days prior to the beginning of the semester that the student wishes to re-enroll. Upon enrolling, the student is required to achieve a minimum semester grade point average of 2.0.

A student who is on probation at the end of the Spring semester may attend Summer School and work toward removing his/her academic deficiencies.

The student who fails to meet the minimum academic requirements after having been suspended and re-admitted is subject to permanent academic dismissal. There is an appeal procedure for academic dismissal.

A part-time undergraduate student enrolled in a degree program must maintain the following minimum cumulative grade point average at the end of the cumulative semester hours indicated for a full-time student.

A part-time undergraduate student is defined as one who enrolls in less than twelve (12) hours during a semester. The part-time student who fails to maintain the minimum average is subject to the actions prescribed for full-time students. A part-time student who enrolls in the University after an academic suspension must achieve minimum semester grade point average of 2.0.

Freshmen or sophomores whose mid-semester grade point average is less than 2.0 will be issued an academic warning indicated by a special notation on mid-semester grade reports issued from the Office of the Registrar.

VETERANS AND PERSONS ELIGIBLE FOR VETERANS BENEFITS

Veterans will be certified for the length of their program. Thereafter, certification will be made on a semester basis contingent upon their potential for completion of their program within a reasonable time. This might be determined by university counseling.

After eight semesters, students must maintain a minimum grade point average of 2.0. To graduate, however, students must complete a minimum of 124 semester hours with a grade point average of 2.0.

Veterans will be certified annually for the length of their program. Thereafter, certification will be made on a semester basis, contingent upon their potential for graduation within a reasonable time, as determined by University counseling.

ACADEMIC DISMISSAL APPEALS

Any student who has been dismissed from the University must be out for a minimum of one semester before an appeal may be made to the Committee on Admission and Academic Retention. Appeals are to be addressed to the Committee on Admission and Academic Retention in care of the Office of the Vice Chancellor for Academic Affairs.

Any student who is placed on academic suspension at the end of the spring semester may attend both sessions of Summer School to remove academic deficiencies. However, if the suspended student does not raise his/her average to the required minimum, the student will remain suspended.

GRADE POINTS

Grade points are computed by multiplying the number of semester hour credits by 4 for courses in which a grade of A is earned - by 3 for a grade of B; by 2 for a grade of C; by 1 for a grade of D. No grade points are given for a grade of F.

GRADE POINT RATIO

The grade point ratio is obtained by dividing the total number of grade points earned by the total number of semester hours attempted.

COURSE NUMBER AND CLASSIFICATION

Each course bears a distinguishing number which identifies it within the department and indicates, broadly, its level. The number system is as follows:

100-399, lower level courses primarily for freshmen and sophomores

400-599, upper level courses primarily for juniors and seniors

600-699, courses for undergraduate and graduate students

700-799, courses for graduate students and appropriate professional students special programs

CLASSIFICATION OF STUDENTS

Students are classified on the basis of semester hours completed excluding remedial and deficiency courses. The following classification scale applies to all students regardless of enrollment date:

CLASSIFICATION	SEMESTER HOURS COMPLETED
Freshman	0-29
Sophomore	30-59
Junior	60-89
Senior	90 or above

CHANGE OF GRADE

A request for a change of grade, for any reason, must be made within one year following the date the original grade was assigned by the faculty member.

GRADE APPEAL

A student may appeal the final grade earned in a course. Initially, the student should attempt to resolve the matter informally through the instructor of the course, the department chair and/or dean of the academic unit in which the grade was assigned. If the matter is not resolved through this level of interaction, then the student should consult the individual school/college on their written grade appeal policy. A student wishing to pursue a written appeal of a grade must demonstrate a legitimate basis for the appeal. Grade appeals are final at the level of the school/college.

CHANGES IN SCHEDULE

A change in a student's program may be made with the consent of his or her advisor or department chairperson. However, if a student's schedule is changed after the designated period for adding and/or dropping courses, the consent of the School Dean is required.

The student must obtain and properly execute the Change of Schedule Form. This form is obtained from the Office of The Registrar and should be returned to that office.

CHANGING SCHOOLS

Students may transfer from one School of the University to another with the written approval and acceptance of the Deans of the Schools involved. The proper forms on which to apply for such a change are to be obtained from the Office of the Registrar and executed at least six weeks prior to the beginning of the semester in which the student plans to transfer. When such a transfer is made students must satisfy the current academic requirements of the school and/or department to which students transfer.

WITHDRAWAL FROM THE UNIVERSITY

A student who wishes, or is asked to leave the University at any time during the semester shall execute and file official withdrawal forms. These forms may be obtained from the University Counseling and Testing Center. They should be completed and submitted to the Office of the Registrar.

A student who withdraws from the University within 15 calendar days of the beginning of the final examination period for the semester shall receive a "W" in all classes enrolled. Failure to execute and file these forms in a timely manner will result in a student incurring the penalty of receiving an "F" for each course in which he or she was enrolled during the semester in question.

RE-ADMISSION OF FORMER STUDENTS

A student who withdraws from the University, voluntarily leaves the University or is suspended, must obtain a permit to register before resuming his/her studies at the University.

The request for a permit must be received by the Office of the Registrar at least thirty (30) days prior to the beginning of the semester in which the student plans to register. When requesting a permit, the student should fill out a re-admission application in the Office of the Registrar.

Before a student is re-admitted who voluntarily leaves or withdraws, his or her academic record is reviewed. If the student did not attain the minimum academic performance level for the number of semesters enrolled at the University, the request for re-admission is subject to be denied.

A former student who has been dismissed from the University for failure to meet the scholastic eligibility requirements may appeal to the Committee on Admissions and Retention for a review of his/her case. The appeal should be addressed to the Committee in care of Vice Chancellor for Academic Affairs.

The student should not present himself for re-enrollment until he/she has received a reply from the Committee. Appeals should reach the committee at least sixty (60) days prior to the beginning of the term in which the person expects to register.

A former student whose attendance has been interrupted by the University for disciplinary reasons must apply to the Vice Chancellor for Student Affairs for a review of their case for possible re-admission.

FIVE YEAR READMISSION POLICY

An undergraduate who has been academically dismissed can only be readmitted under the Five Year Readmission Policy.

Any undergraduate student who has not been enrolled at North Carolina A&T State University for at least five years (10 academic semesters) may be eligible for one readmission

under the “Five Year Readmission Policy.” This policy is subject to a student being able to complete degree requirements without exceeding 152 hours attempted.

Only courses in which a grade of “C” or better was earned will be counted toward graduation. This policy will not alter the student’s original academic record.

The student’s grade point average will begin at the time studies are resumed. A student must maintain a 2.00 GPA on courses taken after readmission to be eligible to continue. Degree requirements will be those in effect at the time the student re-enrolls.

A student who selects the Five Year Readmission Policy will not be recognized as graduating with high honors. Publication of honors and scholarships is made at commencement.

A student must have a curriculum plan that leads to graduation developed jointly with the Department Chairperson and approved by the School/College Dean. This documentation must accompany the Readmission application.

The Five Year Readmission Policy must be exercised at the time of readmission to the University. Once exercised, this policy cannot be reversed.

INCOMPLETES

A student is expected to complete all requirements of a particular course during the semester in which he or she is registered. However, if at the end of the semester, a small portion of the work remains unfinished and should be deferred because of some serious circumstances beyond the control of the student, an “I” may be submitted.

An “I” for a prolonged illness may be submitted only after the written approval of the Vice Chancellor for Student Affairs has been secured. An “I” for other causes may be submitted only with the approval of the Dean of the School.

Along with the recording of the incomplete grade, the instructor must also file with the head of the department, the student’s average grade and a written description of the work which must be completed before the incomplete is removed.

Procedure for the Removal of an Incomplete

An incomplete grade must be removed within SIX WEEKS after the beginning of the next semester. If the student has not removed the incomplete within the time specified, the Incomplete is automatically changed to an “F”. Developmental, thesis and research courses are exempted from the six week time limit.

SEMESTER EXAMINATIONS

A final examination will be required as a part of every course. An examination schedule showing time and place of meeting of each course and section will be published each semester. Schedules so published will be followed without exception. Any changes in the examination schedule must be approved by the Office of Academic Affairs.

HONOR ROLL

To encourage scholarship, the University publishes a Dean’s List at the end of each semester. Regular undergraduate students whose grade point average is 3.00 or higher shall be eligible for the Dean’s List. Students making the Honor Roll must have completed a total of 12 or more semester hours. The cumulative grade point average is 3.00 or higher based on the adjusted hours.

CLASS ATTENDANCE POLICY

Class Attendance

The University is committed to the principle that regular and punctual class attendance is essential to the students' optimum scholastic achievement. An absence, excused or unexcused does not relieve the student of any course requirement.

Regular class attendance is a student obligation, and a student is responsible for all the work, including tests and written work, of all class meetings.

Instructor's Responsibility

- 1) Description of attendance requirements should be stated in the course syllabus and announced in class, particularly at the beginning of each term. If class attendance is to affect a student's course grade, then a statement to that effect must be a part of the course syllabus distributed to each student.
- 2) Instructors will keep attendance records in all classes. Each instructor has the right to prescribe procedures as to how and when attendance will be taken.

Student's Responsibility

It is the responsibility of each student to learn and comply with the requirements set by the instructor for each class in which one is registered. The student should:

- 1) have knowledge of each instructor's attendance and monitoring practices for class absences during the term.
- 2) become familiar with all materials covered in each course during absences and make-up work of any work required by the instructor.
- 3) initiate the request to make-up work on the first day of class attendance after the absence.

Policy on Make Up of Required Course Work

The administration, faculty and staff recognize that there are circumstances and events which require students to miss classes and require course work which may be performed or due on the day of the absence. Also they recognize that required course work is needed to give each student an adequate performance evaluation. Therefore, whenever reasonable (and more specifically described below), students should be allowed to make up required work.

The following definitions will apply with respect to this policy:

- a) Required course work — All work which will be used in the determination of final grades; e.g. examinations, announced quizzes, required papers and essays, required assignments.
- b) Instructor — Person responsible for the course and proving instruction and evaluation.
- c) Permissible reasons for requesting make up of required work — Sickness (verification needed) - death of relatives (immediate family); participation in approved University related activities; acting in the capacity of a representative of the University (band, choir, sports related travel, etc.); extraordinary circumstances (court appearance, family emergency, etc.); require a signed statement. NOTE: Other reasons for requesting make up of required course work are not acceptable.

INSTRUCTORS SHOULD SCHEDULE MAKE UP WORK AT A TIME THAT IS CONVENIENT TO BOTH THE INSTRUCTOR AND THE STUDENT.

- d) Documentation — Verification of sickness requires signed statement of a physician or a duly authorized staff member of the Health Center.

Verification of death requires signed statement from the Minister or Funeral director.

Verification of participation in University related activities requires signed statement from the Office of the Vice Chancellor for Academic Affairs.

Verification of other reasonable circumstances for example: court appearance, family emergency, etc. requires a signed statement from an appropriate official (e.g., Court Official, parent or guardian, etc.)

The policy regarding make-up of required course work is as follows:

- (1) A student may petition an instructor to make up required course work whenever the student has a permissible reason for requesting make up of required course work.
- (2) A student will be required to present documentation which certifies absence constituting permissible reason.
- (3) Whenever possible, a student should consult with the instructor prior to an absence which will involve the failure to do required course work. Arrangements for make up should be discussed and agreed upon at this time.
- (4) A student must petition for make up of required course work on the first day that he returns to class.
- (5) If permission is granted to make up required course work, the instructor and the student should agree on an acceptable date for accomplishing the make up of missed required course work.
- (6) Failure to comply with item 4 may result in the denial to make up required course work.

GENERAL REQUIREMENTS FOR GRADUATION

A candidate for a degree from North Carolina Agricultural and Technical State University must satisfy the following minimum requirements:

1. Choose a specific curriculum leading to a degree in one of the schools and complete the requirements of this curriculum.
2. Complete a minimum of 124 semester hours excluding deficiency courses and remedial work for the Bachelor's degree.
3. Complete the core requirements of the University in English, Mathematics, Natural Science, Social Science Humanities and Health or Physical Education for the Bachelor's degree.
4. Earn an average of two (2) grade points for every semester hour undertaken including hours passed or failed. After completing the number of credit hours required for graduation, if the student is deficient in grade points, he or she must take additional courses that have been approved by his or her academic dean to secure these points. The student must also obtain an average of 2.0 or more in his or her major field.
5. Complete a minimum of three semesters as a full-time student in residence at the University. This requirement includes the two semesters prior to the period when the student completes his/her requirements for graduation. At least one-half of the credits in the student's major field must be earned at the University. Exception to either of these provisions may be made upon the recommendation of the Chairperson of the student's major department with the approval of the School Dean.
6. Clear all academic conditions by the end of the semester preceding graduation.
7. Pay all University bills and fees.

8. File an application for graduation with the Office of the Registrar in accordance with the schedule below:
 - A. May Graduation — By last day for late registration for Spring Semester
 - B. Summer Graduation — By the end of the second week of class in the summer session
 - C. December Graduation — By the last day for the late registration for the Fall Semester

GRADUATION WITH HONORS

Undergraduate candidates who complete all requirements for graduation in accordance with the following stipulations earn the following honors: (1) Those who maintain a general average within the range of 3.00 to 3.24 will receive CUM LAUDE, (2) those who maintain a general average within the range from 3.25 to 3.49 will receive MAGNA CUM LAUDE, and (3) those who maintain a general average within the range of 3.50 to 4.00 will receive SUMMA CUM LAUDE.

All hours attempted are included in the grade point average computation for honors. This means that when a course is repeated both grades are added in the computation. A minimum of 60 percent of the credit hours require for a degree program must be earned at A&T State University to be considered for honors. For example, if the program requires a total of 128 credit hours, 77 of those hours must be earned at A&T. Publication of honors and scholarships is made at commencement.

COMMENCEMENT PARTICIPATION

Students who complete degree requirements during the Summer Session or during the Fall Semester are invited to participate in the commencement exercises along with students who complete degree requirements during the Spring Semester.

Only students who have satisfied all requirements for their degree programs are eligible to march in the commencement exercises.

GRADUATION UNDER A GIVEN CATALOGUE

A student may expect to earn a degree in accordance with the requirements of the curriculum outlined in the catalogue in force when he or she first entered the University provided the courses are being offered. Moreover, he or she must complete these requirements within six years. On the other hand, he or she may graduate under any subsequent catalogue published while he or she is a student. If a student elects to meet the requirements of a catalogue other than the one in force at the time of his or her original interest he or she must meet all requirements of the catalogue he or she elects.

SECOND BACCALAUREATE DEGREE

A student who has received a bachelor's degree from A&T or another accredited college or university may enroll in a program leading to a second degree at the same level providing (1) the major field is different from that of the first degree and (2) the appropriate application for admission or re-admission is filed and approved.

A student seeking a second baccalaureate degree must (1) complete a minimum of twenty-four (24) semester hours beyond those applied to the first or previous degree, excluding transfer credits or substitutions and dependent upon departmental requirements, (2) be in residence for a minimum of two (2) semesters as a full-time student if the first or previous degree was

not earned at A&T; (3) achieve a cumulative minimum point average of 2.0 for all hours attempted for the degree.

GRADE REPORTS

As soon as they are determined at the end of each semester or summer term, a report of grades is sent to the student at his or her permanent home address.

PRIVACY OF STUDENT RECORDS

The University insures students access to their official academic records but prohibits the release of personally identifiable information, other than “directory information”, from these records without their permission, except as specified by public law 93-380. “Directory information” includes: Student’s name, address, telephone number, date and place of birth, school, major, sex, marital status dates of attendance, degree received, honors received, institution (s) attended prior to admission to North Carolina Agricultural and Technical State University, past and present participation in officially recognized sports and activities, and physical factors. Public Law 93-380 further provides that any student may, upon written request, restrict the printing of such personal information relating to himself or herself as is usually included in campus directories. A student who desires to have “directory information” withheld must submit a written request to the Office of The Registrar one week before the beginning of classes for the semester or session in which he or she is enrolled.

ACCESS TO STUDENT RECORDS

1. The policy for the administration of student academic records is in accordance with the Family Educational Rights and Privacy Act of 1974, as amended.
2. A student has the right to inspect and review any and all official records, files, and data directly related to him or her.
3. A student who believes that his or her record contains inaccurate or misleading information shall have an opportunity for a hearing to challenge the content of the record, to insure that the record is not inaccurate, misleading, or otherwise in violation of his or her privacy or rights, and to provide an opportunity for the correction or deletion of any such inaccurate, misleading, or otherwise inappropriate data contained therein or include the student’s own statement of explanation.
4. The University will comply with a request from a student to review his or her record within a reasonable period of time and not later than thirty (30) days after the request is received.
5. The release of academic records requires the written permission of the student, except as provided by public law 93380. Transcripts are not issued to a student who has not met his or her financial obligations to the University.
6. Copies of the “University’s Statement” concerning access to students’ records are available in the Office of The Registrar, the office of each school dean and department chairperson.

CHANGE OF NAME AND ADDRESS

It is the obligation of every student to notify the Office of The Registrar of any change in name or address. Failure to do so can cause serious delay in the handling of the student’s records and in notification of emergencies at home.

TRANSCRIPTS OF RECORDS

Requests for transcripts of students' records should be addressed to the University Registrar. The cost is \$2.00 per copy.

INDEBTEDNESS TO THE UNIVERSITY

No diploma, certificate or transcript of a record will be issued to a student who has not made a satisfactory settlement with the cashier for all indebtedness to the University. A student may not be permitted to attend classes or final examinations after the due date of any unpaid obligation.

PLAN TO IMPROVE GRADUATION RATES

In response to legislation enacted by the General Assembly in 1992, the Board of Governors has adopted a "Plan to Improve Graduation Rates in the University of North Carolina." The plan includes policies that are aimed at decreasing the average time taken for completion of degrees ...

What must a student do to graduate in four years?

Full-time undergraduate students are expected to make scheduled progress toward graduation. Thus, it should be possible for those students to complete most baccalaureate degree programs within four academic years or the equivalent.

What must the University do to expedite student progress?

Effective fall 1995, baccalaureate degree programs shall be limited to no more than 128 semester hours. Any program that requires 135 semester hours or more shall be officially designated as a five-year baccalaureate program.

Also, the University will make every effort to schedule a sufficient number of course sections and/or alternate courses to assist students in meeting their graduation requirements. A new registration/advising system is being tested which will provide progress reports to students and advisors.

What is the graduation rate at the University?

Our data show that 39.1 percent of the first-time full-time freshmen who entered NCA&TSU in Fall 1986 have received a baccalaureate degree from this institution or another UNC institution as of Fall 1992. In addition, another 9.9 percent were enrolled at this or another UNC institution in pursuit of their baccalaureate degrees as of Fall 1992.

Why do some students take longer?

Many students carry fewer credits because they work; others interrupt their schooling for personal reasons. Some students take extra time completing special courses to improve their academic skills. Many students change majors, major in more than one field, or enroll in a major that requires more than 124 semester hours for graduation. A significant number of students take extra time to pursue related educational experiences. Also, some students take extra time for social reasons.

Working students. Nearly 20 percent of our students participate in the college workstudy program. Those students work an average of 15 hours each week. Over 30 percent of our undergraduate students work off campus. Students who work off campus average more than 30 hours a week while taking fewer hours than the on-campus students.

Many students work to help pay for school expenses. Some students work to avoid heavy loan debt upon graduation, and others work to enhance their career prospects after graduation.

tion. However, far too many of our students are working so that they can have automobiles, clothes, apartments, and life styles which are not conducive to succeeding in college.

The Piedmont Triad is an area in which college students may easily find work. Students who work are likely to carry fewer semester hours and are more likely to drop out of school for a while.

Student retention rate. From 1986-1991, the percentage of freshmen on the NCA&TSU campus who returned as sophomores has remained around 77 percent except for 1989 when it reached 86 percent. These figures are up from the mid 60 percent in earlier years. We anticipate that this increased retention of first-year students should be reflected in higher graduation rates over the next few year.

What must a student do to graduate faster?

The students **must** put education **first**. They should enroll in and complete at least 16 hours per semester. They must take advantage of courses offered in Summer Sessions or independent study. They should seek the advice of their assigned academic advisor who knows the degree and major requirements.

The University of North Carolina requires NCA&TSU to publish the following statement with the above material:

Our data show that 46.0 percent of the first-time full-time freshman students who entered North Carolina Agricultural and Technical State University in Fall 1988 have received a baccalaureate degree from this institution or another UNC institution as of Fall 1994. This information is provided pursuant to requirements of the Student-Right-to-Know and Campus Security Act of 1990.

ACADEMIC DISHONESTY POLICY

North Carolina A&T State University is committed to a policy of academic honesty for all students. Examples of Academic Dishonesty include but are not limited to:

- Cheating or knowingly assisting another student in committing an act of academic dishonesty.
- Plagiarism (unauthorized use of another person's words or ideas as one's own) which includes but is not necessarily limited to submitting examinations, theses, reports, drawings, laboratory notes or other materials as one's own work when such work has been prepared by another person or copied from another person.
- Unauthorized possession of examinations or reserve library materials, destruction or hiding of source materials, library materials, or laboratory materials or experiments or any other similar action.
- Unauthorized changing of grades or marking on an examination or in an instructor's grade book, or such change of any grade record.
- Aiding or abetting in the infraction of any of the provisions anticipated under the general standards of student conduct.
- Assisting another student in violating any of the above rules.

A student who has committed an act of academic dishonesty has failed to meet a basic requirement of satisfactory academic performance. Thus, academic dishonesty is not only a basis for disciplinary action but may also affect the evaluation of the student's level of performance. Any student who commits an act of academic dishonesty is subject to disciplinary action as defined below.

In instances where a student has clearly been identified as having committed an academic act of dishonesty, the instructor may take appropriate punitive action including a loss of credit for an assignment, an examination or project, or award a grade of "F" for the course subject to the review and endorsement of the Chairperson and the Dean. Repeated offenses could even lead to dismissal from the University.

Student Appeals on Academic Dishonesty

A student who feels unfairly treated as a result of an academic dishonesty matter may appeal the action in writing to the University Judicial Tribunal. The written notice of appeal must be submitted within one week (seven calendar days) of the date of the incident. The student should refer to the section on Appellate Procedures in the Student Handbook.

SCHOOL OF AGRICULTURE

Daniel D. Godfrey, Dean

OBJECTIVES

The School of Agriculture is organized in the land-grant university tradition where programs of resident instruction in the food and agricultural sciences as well as closely related areas are offered. Agricultural Research and Cooperative Extension complete the land grant institution triumvirate. Formal programs of resident instruction through curricula in agriculture have served the state's citizens successfully for 100 years.

Instructional programs provide a strong foundation in the natural sciences, social sciences and economics which support curricula in agricultural sciences and home economics. The faculty trained in the basic and applied sciences pertaining to agriculture and related areas consists of scholars whose contributions to instruction, research, and outreach are recognized well beyond the reaches of this university.

AGRICULTURAL RESEARCH PROGRAM

Organized research is conducted in Agriculture and Home Economics by a research faculty with joint appointments in the instructional program. Much of the research activity is sponsored by the United States Department of Agriculture. It is conducted on the University farm and in on-campus laboratories where investigations include such disciplines as Agricultural Economics, Animal Science, Plant Science, Landscape Architecture and Design, Human Nutrition, Housing, Food Science, and Animal Health.

COOPERATIVE EXTENSION PROGRAM

Cooperative Extension is an educational service which provides information and assistance in a broad range of subjects to individuals, families, and organized groups in rural and urban areas of the state. The Cooperative Extension Program at North Carolina Agricultural and Technical State University is an integrated function of the state-wide program headquartered at North Carolina State University, Raleigh, North Carolina.

INTERNATIONAL AGRICULTURAL PROGRAM

The International Agricultural Program involves all departments in the School of Agriculture and relates to the University International Program through the Office of the Coordinator for International Agriculture.

In overseas locations, research, teaching, and community out-reach are conducted by faculty in association with long-term development assistance projects. Additionally, faculty share their expertise through short-term assignments for consultation in various overseas settings.

INSTRUCTIONAL PROGRAMS

Departmental Organization:

The School of Agriculture is organized into the following departments: (1) Agricultural Economics and Rural Sociology, (2) Agricultural Education and Extension, (3) Animal Science, (4) Human Environment and Family Sciences, and (5) Natural Resources and Environmental Design.

Requirements for Admissions:

The requirements for admission to the School of Agriculture are the same as the general requirements for admission to the University.

Requirements for Graduation:

The requirements for graduation for the Bachelor of Science Degree are as follows:

1. The student must have satisfied the course requirements of an approved curriculum in an organized department administered by the School of Agriculture.
2. The student must have earned a cumulative average quality of at least a "C" in his or her major courses and in his or her overall academic program.

Curricula:

Departments of the School of Agriculture provide several program options through curricula leading to the Bachelor of Science Degree. These program options accommodate specialization in several areas of the food and agricultural sciences, home economics, and certain allied areas.

The Master of Science Degree is offered in Agricultural Education, Plant and Soil Science, Agricultural Economics, and Foods and Nutrition. (For further details please consult the Graduate School Bulletin.)

Department of Agricultural Economics and Rural Sociology

Alton Thompson, Acting Chairperson

OBJECTIVES

The Department of Agricultural Economics and Rural Sociology offers programs leading to the Bachelor of Science and Master of Science in Agricultural Economics. Students who pursue the Bachelor of Science degree may concentrate in Agricultural Economics and/or Agri-business. Also, students majoring in Agricultural Economics may concentrate in Rural Sociology by taking prescribed courses in Sociology and Rural Sociology.

The objective of the undergraduate programs is to train students in the understanding and application of concepts and analytical tools of economics and business in a systematic method in order to identify, analyze, and resolve management problems of the farm, agribusiness firms, rural communities, and concerned government agencies, as well as preparing students for further study in Agricultural Economics.

DEGREES OFFERED

Agricultural Economics - Bachelor of Science

Agricultural Business - Bachelor of Science

*Agricultural Economics - Master of Science

**See the bulletin for Graduate School.*

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program is based upon the general admission requirements of the University.

DEPARTMENT REQUIREMENTS

The undergraduate major in Agricultural Economics must complete a minimum of 127 semester hours of University courses. Both Agricultural Economics majors and the Agri-business majors must take a minimum requirement of 37 semester hours in Agricultural and General Economics.

A representative distribution of disciplines, and requirements for the undergraduate Agricultural Economics majors is as follows:

<u>Discipline Areas</u>	<u>Agricultural Economics Major</u>	<u>Agri-Business Majors</u>
General Education	48 Semester Hours	45 Semester Hours
Agricultural Economics	31 Semester Hours	31 Semester Hours
Economics	12 Semester Hours	12 Semester Hours
Technical Agriculture	9 Semester Hours	9 Semester Hours
Electives	27 Semester Hours	12 Semester Hours
Business Administration and Accounting		18 Semester Hours

CAREER OPPORTUNITIES

A bachelor's degree in Agricultural Economics prepares students for careers in teaching extension, agricultural-related business firms and industries, government and private research firms, government services (legislative, administration, or professional), as well as for further study for higher degrees.

REQUIRED COURSES FOR AGRICULTURAL ECONOMICS AND AGRICULTURAL-BUSINESS MAJORS

Course & Number	*Credit Hours	Course Title
AGEC 130	1	Food and Agribusiness Industries
AGEC 240	3	Introduction to Computers in Agribusiness
ECON 300	3	Principles of Economics (Micro)
ECON 301	3	Principles of Economics (Macro)
AGEC 330	3	Introduction to Agricultural Economics
AGEC 332	3	Elements of Farm Management
AGEC 334	3	Marketing Agricultural Products
AGEC 336	3	Agricultural Prices
ECON 305 or AGEC 644	3	Elementary Statistics Statistical Methods in Agricultural Economics I
ECON 310 or AGEC 646	3	Advanced Statistics Statistical Methods in Agricultural Economics II
ECON 410	3	Intermediate Micro Theory
ECON 420	3	Intermediate Macro Theory
AGEC 675	3	Computer Applications in Agricultural Economics

* A grade of "C" must be made in all of the above requirements.

CURRICULUM GUIDE FOR THE MAJOR IN AGRICULTURAL BUSINESS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 130	1	ENGL 101	3
ENGL 100	3	HIST 101	3
HIST 100	3	MATH 131 or MATH 112	4
MATH 111	4	PHYS 100	4
BIOL 100	4	Elective (Free)	<u>3</u>
PHED 200	<u>2</u>		17
	17		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
ECON 300	3	ECON 301	3
SPCH 250	3	AGEC 330	3
AGEC 200	3	ANSC 111	3
NARS 110	3	ECON 305 or AGEC 644	<u>3</u>
AGEC 240	<u>3</u>		15
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 332	3	ACCT 222	3
AGEC 334	3	PSYC 320	3
ACCT 221	3	ECON 420	3
ECON 410	3	ANSC 351	3
ECON 310 or AGEC 646	<u>3</u>	Electives (Major Area) ¹	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 336	3	BUAD 453	3
BUAD 461	3	BUAD 462	3
AGEC 675	3	Electives (Major Area) ¹	3
AGEC 640	3	Electives	<u>6</u>
Elective (Free)	<u>3</u>		15
	15		

Total Credit Required: 127

Major area electives and other electives should be chosen by the student in consultation with advisor.

¹ 6 hours - BUAD 341, BUAD 422, BUAD 430, BUAD 435, TRAN 360, ECON 401, ECON 412, ECON 415, ECON 501, ECON 512

CURRICULUM GUIDE FOR THE MAJOR IN AGRICULTURAL ECONOMICS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 130	1	ENGL 101	3
ENGL 100	3	HIST 101	3
HIST 100	3	MATH 131 or MATH 112	4
MATH 111	4	PHYS 100	4
BIOL 100	4	Elective (free)	<u>3</u>
PHED 200	<u>2</u>		17
	17		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
ECON 300	3	ECON 301	3
AGEC 200	3	AGEC 330	3
AGEC 240	3	FOLA	3
FOLA	3	ANSC 111	<u>3</u>
NARS 110	<u>3</u>		15
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ANSC 351	3	ECON 420	3
ECON 410	3	ECON 310 or AGECE 646	3
ECON 305 or AGECE 644	3	AGECE 336	3
AGECE 334	3	SPCH 250	3
AGECE 332	<u>3</u>	Elective (Major Area) ¹	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGECE 638	3	Electives (Major Area) ¹	3
AGECE 675	3	Elective (Free)	6
Elective (Free)	3	Electives (BUAD or MATH) ²	<u>6</u>
Electives (BUAD or MATH) ²	<u>6</u>		15
	15		

Total Credit Required: 127

Major and other electives should be chosen by the student in consultation with advisor.

¹ 6 hours - BUAD 341, BUAD 430, BUAD 435, TRAN 360, ECON 401, ECON 412, ECON 415, ECON 501, ECON 512

² 12 hours - BUAD 341, BUAD 422, BUAD 430, BUAD 435, MATH 132, MATH 350, MATH 624.

COURSES WITH DESCRIPTION IN AGRICULTURAL ECONOMICS

Undergraduate

AGEC-130. Survey of the Food and Agribusiness Industries **Credit 1(1-0)**

An introductory overview of the characteristics, scope and functions of the U.S. food and fiber production/processing/distributing system: showing the relationships of input supply, farm production, and product processing - distribution-marketing complex, and their role in meeting food and fiber needs of people: identification of possibilities and requirements for training and services.

AGEC-240. Introduction to Computers in Agribusiness **Credit 3(3-0)**

A course designed to familiarize students with the growing role of computers as a management aid in agribusiness. Topics covered include: electronic spread sheets, word processing, data base management, telecomputer communication flow charting, etc. Emphasis will be placed on the application of software to agribusiness and agricultural economics analysis.

AGEC-330. Introduction to Agricultural Economics **Credit 3(3-0)**

An application of the fundamental principles of economics to agricultural production, marketing, land tenure, leasing arrangements, financing and related economic problems.

AGEC-332. Elements of Farm Management **Credit 3(3-0)**

Principles which govern the effective organization and operation of the farm firm.

AGED-334. Marketing Agricultural Products **Credit 3(3-0)**

Principles and practices of marketing as applied to farm commodities. Form, place, time and possession utility, the ultimate consumer's market, the agricultural industries market, the middleman system, exchange market operation and future contracts, price determination, reducing marketing costs. Visits will be made to local markets. Prerequisite: AGECE 330.

AGEC-336. Agricultural Prices **Credit 3(3-0)**

Information regarding agricultural price changes, index numbers, price determination, seasonal and cyclical price movements, storage problems, and methods of controlling extreme price fluctuations, government price policy.

AGEC-440. Resource Economics **Credit 3(3-0)**

Analysis of economic problems of resources use and management. Perception of and definition of problems in terms of allocation mechanism. Analysis of economic relationships over time and market externalities with emphasis on welfare implications. Prerequisite: ECON 300.

AGEC-442. Cooperative Marketing **Credit 3(3-0)**

Early cooperative movements, principles of cooperatives, importance of cooperatives in the United States, problems of organization, management and operation of cooperative endeavors by farmers in buying and selling. Prerequisites: AGECE 330 and 334.

AGEC-444. Agribusiness Marketing Analysis **Credit 3(3-0)**

A course designed to develop an understanding of, and skill in, the marketing decision-making process. Emphasis will be placed on the competitive marketing environment and the analytical tools needed by the firm to make sound strategic marketing decisions. Case studies and marketing simulation games will be used where appropriate.

AGEC-446. Financial Management of Agribusiness Firms **Credit 3(3-0)**

Principles and techniques of management of short-term and long-term capital. Financial analysis, and special problems related to the acquisition and use of funds. Case studies and financial simulation games will be used where appropriate.

AGEC-530. Economics of Food Distribution**Credit 3(3-0)**

Description of market structures and operations in the processing, and wholesale and retail distribution of food. The effect of industrial organization and government regulations on the efficiency of the market and consumer demand for food.

AGEC-599. Independent Study I**Credit 3(3-0)**

This course is designed to provide academic credit to students of advanced undergraduate standing who are on cooperative internship or apprenticeship programs, when the nature of the assignment warrants such credits.

Advanced Undergraduate and Graduate**AGEC-630. Rural Development Seminar****Credit 3(3-0)**

Discussion of current issues in rural and agricultural development in the U.S. and in developing countries. Review and discussion of current literature and reports or proposals on rural or agricultural development programs and policies. Prerequisite: Consent of the Department Chairman.

AGEC-632. Agri-Business Policy**Credit 3(3-0)**

The place of agri-business in the national and international economy; the impact of public policy on the industry. An analysis of policy as it relates to price support programs, finance, trade and resource development. Prerequisite: AGECE 330.

AGEC-634. Commodity Marketing Problems**Credit 3(3-0)**

Economic problems arising out of the demand, supply and distribution of specific agricultural commodities; the price making mechanism, marketing methods, grades, values, price, cost, and governmental policy. Not more than two commodities will be studied in any one semester. Selection of commodities and emphasis on problem areas will be made on the basis of current need; commodities studied will be cotton, tobacco, fruits and vegetables, and grains. Prerequisite: Consent of the Department Chairman.

AGEC-638. Special Problems in Agricultural Economics**Credit 3(3-0)**

Designed for students who desire to work out special problems in the field of agricultural economics; problem definition, formulation and investigation. Prerequisite: Consent of the Department Chairman.

AGEC-640. Agri-Business Management**Credit 3(3-0)**

Methods of research, plans, organization, and the application of management principles. Part of the student's time will be spent in consultation with agri-business firms. Prerequisite: Consent of the Department Chairman.

AGEC-641. Special Problems in Agri-business Management**Credit 3(3-0)**

This course relies heavily on the "Harvard Case Studies Approach" to make decisions and solve problems faced by agribusiness managers. Also, students will be exposed to quantitative techniques for analyzing and solving problems confronting the firm. Emphasis is placed on applying theoretical concepts to the real-world decision-making environment. Prerequisites: AGECE 640, or consent of instructor.

AGEC-642. Seminar in Agricultural Economics**Credit 3(3-0)**

Discussion of reports and an appraisal of current literature on agricultural problems. Prerequisite: Consent of the Department Chairman.

AGEC-644. Statistical Methods in Agricultural Economics I**Credit 3(3-0)**

Statistical methods with special applications to agricultural problems. The statistical table, ratios, percentages, bar charts, line charts, and frequency distribution are used as analytical tools. Prerequisites: AGECE 330, ECON 301, or SOCI 302.

AGEC-646. Statistical Methods in Agricultural Economics II **Credit 3(3-0)**
Statistical methods with special applications to agricultural problems. The time series analysis, sampling theory, analysis of variance, and simple correlation are used as analytical tools. This course is a continuation of AGECEC 644.

AGEC-648. Appraisal and Finance of Agri-Business Firms **Credit 3(3-0)**
Principles of land evaluation, appraisal and taxation. The role of credit in a money economy, classification of credit, principles underlying the economic use of credit. The role of the government in the field of credit.

AGEC-650. Human Resource Development **Credit 3(3-0)**
Analysis of human resources in relation to changing agricultural production technology in rural areas. Prerequisite: Consent of instructor.

AGEC-675. Computer Applications in Agricultural Economics **Credit 3(3-0)**
This course is designed to provide students with the tools to utilize computers for agricultural decision-making. Emphasis will be placed on utilizing existing software packages for micro-computers and mainframe computers to make financial, economic and quantitative analyses of farm and agribusiness-related problems. Prerequisites: AGECEC 330, or ECON 300.

COURSES WITH DESCRIPTION IN RURAL SOCIOLOGY

AGEC-200. Principles of Rural Sociology **Credit 3(3-0)**
Social systems, cultural patterns, and institutional arrangements of people in rural environments. An interpretation of the structure, functioning and change in rural social systems.

AGEC-301. Rural Social Problems **Credit 3(3-0)**
A focus on the problems and solutions of population dynamics, education, religion, health, land tenure, parity income, farm labor, mechanization, housing, poverty, and rural development as they affect the growth of the rural community.

AGEC-303. Rural Family **Credit 3(3-0)**
The institutional nature of the rural family, its role in the community, including its relations to educational, religious, welfare and other community organizations.

AGEC-505. Rural Standards of Living **Credit 3(3-0)**
Consumption behavior in the main community groups of our rural society. The poverty threshold and the plight of the rural poor.

AGEC-506. Special Problems in Rural Sociology **Credit (2 to 4 hrs)**
Work on problems in the rural society under the guidance of a faculty member.

DIRECTORY OF FACULTY **Agricultural Economics and Rural Sociology**

William Amponsah, B.S., Berea College; M.S., University of Kentucky; Ph.D., Ohio State University; Adjunct Assistant Professor

Shirley Callaway, B.S., University of Arkansas at Pine Bluff; M.S., University of Arkansas; Ph.D., Penn State University; Agricultural Extension Faculty

Godfrey Ejimakor, B.S., North Carolina State University; M.S., N.C. A&T State University; Ph.D., Texas Tech; Adjunct Assistant Professor

Daniel Godfrey, B.S., N.C. A&T State University; M.S., North Carolina State University at Raleigh; Ph.D., Cornell University; Agricultural Extension, Director and Faculty

Robin Henning, B.S., M.S., Ohio State University; Ph.D., Cornell University; Adjunct Associate Professor

Donald R. McDowell, B.S., Southern University A&M; M.S., Ph.D., University of Illinois; Associate Professor

John O'Sullivan, B.A., Stanford University; M.S., Auburn University; Ph.D., University of California at Los Angeles; Agricultural Extension Faculty

John Paul Owens, B.S., Appalachian State University; M.S., N.C. A&T State University; Adjunct Lecturer

Richard D. Robbins, B.S., N.C. A&T State University; M.S., Ph.D., North Carolina State University at Raleigh; Professor

Alton Thompson, B.S., North Carolina Central University; M.S., Ph.D., Ohio State University; Associate Professor, and Acting Chairperson

Christopher O. Walson, B.S., M.S., North Carolina A&T State University; Ph.D., University of Illinois; Adjunct Assistant Professor

Anthony K. Yeboah, B.S., University of Science and Technology; M.S., Ph.D., Iowa State University; Associate Professor

Department of Agricultural Education and Extension

Acting Chairperson
Richard D. Robbins

The Department of Agricultural Education and Extension prepares students for positions in educational fields in agriculture and related areas including schools and colleges, agricultural extension, business, trade and professional associations, and government agencies. The Department administers a program approved by the State Department of Public Instruction for the preparation of teachers of agriculture in the public school systems. The program includes courses in general education, professional education, and technical agriculture.

The Agricultural Education majors in Teacher Education are expected to complete a second major in a basic academic discipline to include 21-27 semester credit hours. The second major options available to the Agricultural Education majors are: Biology; Chemistry; Economics; English; Mathematics; Psychology; and Sociology.

In addition to the second major advantage, the Agricultural Education major may follow a technical concentration by satisfactorily completing a minimum of 12 semester credit hours of technical agriculture electives in any one of the following technical agriculture areas: Agricultural Economics; Agricultural Engineering; Animal Science; Horticulture; Plant Science; and Soil Science.

DEGREES OFFERED

Agricultural Education - Bachelor of Science

*Agricultural Education - Master of Science

GENERAL PROGRAM REQUIREMENTS

Admission of students to the undergraduate degree program in Agricultural Education is based on the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

The Agricultural Education majors must complete 127 semester hours of credit. Included in the 127 semester hours are general education courses, professional education courses, and

technical agriculture courses. A 2.0 grade point average must be achieved and maintained in these courses. The students must earn a minimum grade of "C" or better in all Agricultural Education courses in this curriculum in order to meet major field requirements. A minimum GPA of 2.5 or better is required for admission to the teacher education option.

CAREER OPPORTUNITIES

A degree in Agricultural Education prepares students for careers in educational fields in agriculture and related areas. These included teaching and supervision in schools and colleges, agricultural extension, business and industry, trade and professional organizations and governmental agencies.

CURRICULUM GUIDE FOR THE MAJOR IN AGRICULTURAL EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100 & 110 or 104 & 114	4
AGED 101	1	AGED 102	1
PHED Electives	<u>1</u>	PHED (Electives)	<u>1</u>
	15		15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
SPCH 250	3	ENGL 305	3
PSYC 320	3	PSYC 325	3
PLSC 110	3	ANSC 111	3
AGEN 114	3	ECON 300 or AGECE 330	3
PHED 200	<u>2</u>	Second Major Elective	<u>3</u>
	17		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGED 400	2	AGED 402	2
AGED 401	2	AGED 403	2
SLSC 338	4	EDUC 400	3
Technical Agriculture Elective	3	Technical Agriculture Elective	3
Second Major Elective	3	Second Major Electives	<u>5</u>
Free Electives	<u>3</u>		15
	17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGED 501	3	AGED 502	6
AGEC 300 or AGED 609	3	AGED 503	3
Technical Agriculture Elective	3	Free Elective	<u>3</u>
Second Major Electives	<u>9</u>		<u>12</u>
	18		

Total Credit Hours: 127

CURRICULUM GUIDE FOR THE CONCENTRATION IN AGRICULTURAL EXTENSION EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100 & 110 or 104 & 114	4
AGED 101	1	AGED 102	1
PHED Elective	<u>1</u>	PHED Elective	<u>1</u>
	15		15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 250	3	ENGL 305	3
ENGL 200	3	ENGL 201	3
PSYC 320	3	PSYC 325	3
PLSC 110	3	ANSC 111	3
AGEN 114	3	PHED 200	2
ECON 300 or AGECE 330	<u>3</u>	BIOL 140 or BIOL 160	<u>4</u>
	18		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGED 400	2	AGED 402	2
AGED 401	2	AGED 403	2
SLSC 338	4	BIOL 121	4
AGED 607	3	CUIN 400	3
Area of Concentration	3	Area of Concentration	<u>3</u>
Free Elective	<u>3</u>		<u>14</u>
	17		

Senior Year			
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 332	3	AGED 503	3
AGED 501	3	AGED 404	3
AGED 608	3	AGED 405	3
AGEC 300 or AGED 609	3	AGED 406	3
Area of Concentration	3		12
Free Elective	3		
	18		

Total Credit Hours: 127

Each students' program will be worked out on an individual basis by the student and his/her adviser. Suggested courses for each option are available in the Agricultural Education and Extension Department.

COURSES AND DESCRIPTION IN AGRICULTURAL EDUCATION

Undergraduate

AGED-101. Introduction and Orientation Credit 1(1-0)

A study of the broad base of modern agriculture with emphasis on current trends and opportunities.

AGED-102. Introduction and Orientation Credit 1(1-0)

A continuation of 101 with special emphasis on the development of agriculture as a modern technology and the impact of science on its development.

AGED-300. Introduction to International Agriculture Credit 3(3-0)

This is an introductory course to acquaint students with international agriculture and agricultural developments including relationship between agricultural systems in various countries and the impact of world agriculture on the United States and other countries. An introduction for students who plan careers in agricultural education in the United States or other countries.

AGED-400. Audio-Visual Aids in Vocational and Technical Education Credit 2(1-2)

Techniques in preparing, using, and evaluating audio-visual aids in vocational and technical education.

AGED-401. Youth Organizations and Leadership Credit 2-3(3-0)

Practices and procedures of leadership development and the organization of youth groups in secondary schools, agricultural extension, and other community programs.

AGED-402. Secondary Education in Agriculture Credit 2(2-0)

Designed to acquaint students with the historical objectives of vocational education and agriculture, the problems in the area of secondary schools, and some solutions.

AGED-403. Teaching Out-of-School Groups Credit 2(2-0)

Methods and materials used in teaching adults and young farmers. It will include developing and using various teaching devices and aids for out-of-school groups.

AGED-404. Field Experiences in Vocational Agriculture Credit 3(0-3)

Participation in activities relating to programs, methods, and skills basic to teaching vocational agriculture. Repeatable to a maximum of six credits.

AGED-405. Field Experiences in Cooperative Extension Credit 3(3-0)

Participation in experiences involving cooperative extension programs. Repeatable to a maximum of six credits.

AGED-406. Field Experiences in Other Agricultural Education Programs

Credit 3(3-0)

Participation in experiences in agricultural education other than vocational agriculture and cooperative extension. Repeatable to a maximum of six credits.

AGED-501. Materials and Methods of Teaching Agricultural Education and Extension

Credit 3(3-0)

Principles of teaching as applied to agriculture in secondary schools and cooperative extension. Preparing and using lesson plans and organizing teaching aids to meet educational and community needs. Prerequisites: AGED 400, 401, and 402; PSYC 320.

AGED-502. Student Teaching

Credit 6(6-0)

Students will be required to spend a minimum of twelve weeks in an approved teaching center doing observation and directed student teaching. Prerequisite: AGED 501.

AGED-503. Evaluation and Problems in Teaching

Credit 3(3-0)

The process of discovering and analyzing problems in the field; program building, and evaluation of instruction in Agricultural education and extension. This will include an appraisal of all phases of teaching. Prerequisites: AGED 501 and 502.

Advanced Undergraduate and Graduate

AGED-600. Youth Organization and Program Management

Credit 3(3-0)

Principles, theories, and practices involved in organizing, conducting, supervising and managing youth organizations and programs. Emphasis will be on the analysis of youth organization and programs in Vocational and Extension Education.

AGED-601. Adult Education in Vocational and Extension Education

Credit 3(3-0)

A study of the principles and problems of organizing and conducting programs for adults. Emphasis is given to the principles of conducting organized instruction in agricultural education, extension and related industries.

AGED-603. Problem Teaching in Vocational and Extension Education

Credit 3(3-0)

Practices in setting up problems for teaching unit courses in vocational and extension education.

AGED-604. Public Relations in Agriculture

Credit 3(3-0)

Principles and practices of organizing, developing, and implementing public relations for promoting local programs in vocational agriculture and agricultural extension.

AGED-605. Guidance and Group Instruction in Vocational and Extension Education

Credit 3(3-0)

Guidance and group instruction applied to agricultural occupations and other problems of students in vocational and extension education.

AGED-606. Cooperative Work-Study

Credit 3(3-0)

Principles, theories, organizations, and administration of cooperative work experience programs.

AGED-607. Environmental Education

Credit 3(3-0)

Principles and practices of understanding the environment and the interrelated complexities of the environment. The course will include a study of agricultural occupations related to the environment and materials that need to be developed for use by high school teachers of agriculture and other professional workers.

AGED-608. Agricultural Extension Organization and Methods

Credit 3(3-0)

Principles, objectives, organization, program development, and methods in cooperative extension.

AGED-609. Community Analysis and Rural Life**Credit 3(3-0)**

Educational processes, structure and function of rural society, and the role which diverse organizations, agencies, and institutions play in the education and adjustment of rural people to the demands of modern society.

AGED-610. International Education in Agriculture**Credit 3(3-0)**

This course examines formal and informal agricultural education systems and related situations and processes which influence agricultural development in developing countries. Included are the nature and scope of the world food situation, the rationale and extent of U.S. involvement in development efforts, and the agencies and organizations involved and procedures they use. Educational programs that will enable families to improve their quality of life will be emphasized.

AGED-664. Occupational Exploration of Middle Grades**Credit 3(3-0)**

Designed for persons who teach middle grades occupational exploration in the curriculum, sources and uses of occupational information, approaches to middle grades teaching, and philosophy and concepts of occupational education. These courses will be taught in cooperation with the Department of Business Education and Administrative Services, Home Economics, and Industrial Education.

AGED-665. Occupational Exploration in the Middle Grades-Agricultural Occupations**Credit 3(3-0)**

Emphasis will be placed on curriculum, methods and techniques of teaching, and resources and facilities for teaching in the agricultural and environmental occupations cluster including Agribusiness and Natural Resources, Environmental Control, Hospitality and Recreation, and Marine Science.

DIRECTORY OF FACULTY

Austin M. Bull, B.S., St. Augustine's College; M.S., North Carolina Agricultural & Technical State University; Ph.D., Virginia Polytechnic Institute and State University; Adjunct Assistant Professor

Carey L. Ford, B.S., M.S., North Carolina Agricultural & Technical State University; Ph.D., Iowa State University; Associate Professor

Daniel M. Lyons, B.S., M.S., North Carolina Agricultural & Technical State University; Ed.D., Virginia Polytechnic Institute and State University; Agricultural Extension Faculty

Dalton H. McAfee, B.S., Alcorn State University; M.S., Tuskegee Institute; Ph.D., Ohio State University; Agricultural Extension Faculty

Francis O. Walson, B.S., M.S., North Carolina A&T State University; Ed.D., Virginia Polytechnic Institute and State University; Adjunct Assistant Professor

Department of Animal Science

George A. Johnson, Chairperson

OBJECTIVES

The objectives of the Animal Science Department are to prepare students for admission to graduate school, professional school, research and industry; and to provide a service to the people of North Carolina, the Southeast, the United States and the world through resident instruction, research and continuing education.

DEGREES OFFERED

Agricultural Science (Animal Science) - B.S.

Agricultural Technology (Animal Husbandry) - B.S.

Laboratory Animal Science - B.S.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the Department of Animal Science is based upon general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

The programs leading to the B.S. degree in Agricultural Science and in Agricultural Technology require a minimum of 124 semester hours. The program leading to the Bachelor of Science degree in Laboratory Animal Science requires a minimum of 127 semester hours.

CAREER OPPORTUNITIES

Agricultural Science and Agricultural Technology

Career opportunities are available in the following areas: livestock feed industry, livestock production, meat processing, livestock marketing, dairy industry, poultry industry, teaching, research and governmental agencies.

Laboratory Animal Science

Career opportunities for the Laboratory Animal Scientist are found in: pharmaceutical companies; local, state and federal regulatory agencies; biomedical research organizations; animal breeding firms; and laboratory animal resource establishments.

The curriculums in Laboratory Animal Science and Agricultural Science (Animal Science) prepare graduates for admission to schools of veterinary medicine and graduate programs in animal health and related specialties.

CURRICULUM GUIDE FOR THE MAJOR IN AGRICULTURAL TECHNOLOGY (ANIMAL HUSBANDRY)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
ANSC 111	3	MATH 102	3
BIOL 101	4	AGEN 114	3
MATH 101	3	BIOL 240	4
AGED 101	1	AGED 102	1
	<hr/> 14	ANSC 212	<hr/> 3
			<hr/> 17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
HIST 100	3	HIST 101	3
CHEM 101, 111	4	CHEM 102, 112	4
ANSC 316	3	ANSC 214	3
PLSC 110	3	PHED 200	2
	<u>16</u>		<u>15</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 301	3	AGEC 330	3
ANSC 321	3	ANSC 311	3
SLSC 338	3	BIOL 121	4
BIOL 160	4	ANSC 351	3
*Professional Electives ¹	4	*Professional Electives ¹	3
	<u>17</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PLSC 307	3	AGEN 402	3
Professional Electives ¹	6	AGEC 332	3
Electives (Free)	5	Professional Electives ¹	6
	<u>14</u>	Electives (Free)	3
			<u>15</u>

Total Credit Hours: 124

The major emphasis electives are to be selected in consultation with and consent of the advisor to enable you to specialize in meat animal, dairy or poultry production.

Required courses for meat animal emphasis: ANSC 312 and 413, ANSC 461.

Required courses for dairy emphasis: ANSC 340, ANSC 413 and ANSC 461.

Required courses for poultry emphasis: ANSC 556, 641 and 657.

The 39 credits as major electives are to be taken such that: 16 credits are selected from supporting courses; 23 credits are selected from one of the following areas of concentration: Animal Science, Dairy Science, Dairy Technology and Poultry. A performance level of grade "C" or better is required in these 39 credits.

¹ ANSC 312, 461, 556, 657; AGECE 334, 336; SPCH 250, 251; CHEM 251, 252; AGEN 303, 523

Supporting Courses (Electives)

AGEC 334, 336; BUAD 430; SPCH 250, 251; CHEM 251, 252; AGEN 303, 523; CM 490; MATH 240.

CURRICULUM GUIDE FOR THE MAJOR IN AGRICULTURAL SCIENCE (ANIMAL SCIENCE)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
ANSC 111	3	AGEN 114	3
BIOL 101	4	BIOL 140	4
MATH 111	4	MATH 112	4
AGED 101	1	AGED 102	1
	<u>15</u>		<u>15</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
HIST 100	3	HIST 101	3
CHEM 106, 116	5	CHEM 107, 117	5
ANSC 212	3	ANSC 214	3
PLSC 110	3	PHED 200	2
	<u>17</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	4	PHYS 226	4
ECON 301	3	MATH 224	3
CHEM 221, 223	5	CHEM 222, 224	5
ANSC 351	3	BIOL 160	4
ANSC 316	3		<u>16</u>
	<u>18</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 330	3	SLSC 338	3
BIOL 221	4	ANSC 321	3
Professional Electives ¹	2	Professional Electives ¹	6
Electives (Free)	3	Free Electives	3
	<u>12</u>		<u>15</u>

Total Credit Hours: 124

The major emphasis electives are to be selected in consultation with and consent of the advisor to enable you to specialize in meat animal, dairy or poultry production.

Required courses for meat animal emphasis: ANSC 312 and 413; ANSC 461.

Required courses for dairy emphasis: ANSC 340, ANSC 413, and ANSC 461.

Required courses for poultry emphasis: ANSC 556, 641 and 657.

The 30 credits as major electives are to be taken such that: 12 credits are selected from supporting courses; 18 credits are selected from one of the following areas of concentration: Animal Science, Dairy Science, Dairy Technology and Poultry. A performance level of grade "C" or better is required in these 30 credits.

¹ ANSC 413, 461, 556, 657; BIOL 461, 465, 466; AGECE 332, 334, 336; CHEM 222, 224, 251, 252; SPCH 250, 251

Supporting Courses (Electives)

BIOL 461, 465, 466; AGECE 332, 334, 336; CHEM 222, 224, 251, 252; SPCH 250, 251.

Courses listed below are identified as major field courses in the Agricultural Technology (Animal Husbandry) and Agricultural Science (Animal Science) curriculums where a major field G.P.A. of 2.00 or better is required.

ANSC 111	ANSC 351
ANSC 212	ANSC 413
ANSC 214	ANSC 461
ANSC 311	ANSC 555
ANSC 312	ANSC 556
ANSC 316	ANSC 641
ANSC 321	ANSC 657
ANSC 340	

CURRICULUM GUIDE FOR THE MAJOR IN LABORATORY ANIMAL SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 106, 116	5	CHEM 107, 117	5
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
PHED (Elective)	1	PHED (Elective)	1
LASC 161	1	LASC 162	3
HIST 100 or 101	3		16
	<u>17</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 101	4	BIOL 160 or 240	4
CHEM 221, 223	5	CHEM 222, 224	5
ENGL 200	3	ENGL 201	3
LASC 261	3	LASC 262	3
SPCH 250	3	MATH 224	3
	<u>18</u>		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ANSC 214	3	BIOL 221	4
LASC 361	4	LASC 362	3
LASC 365	4	POLI 200	3
PHYS 225, 235	4	PHYS 226, 236	4
CHEM 251, 252	3	Electives (Free)	3
	<u>18</u>		17

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 522	3	ANSC 611	3
LASC 462	3	LASC 461	3
LASC 569	1	LASC 636	3
Professional Electives ¹	3	LASC 653	4
	<u>10</u>		<u>13</u>

Total Credit Hours: 127

¹ LASC 363, 463, 464, 465, 466, 564, 660.

Courses listed below are identified as major field courses in the Laboratory Animal Science curriculum where a major field g.p.a. of 2.00 or better is required as indicated in the overall graduation requirements.

LASC 161	LASC 365
LASC 162	LASC 461
LASC 261	LASC 462
LASC 262	LASC 569
LASC 361	LASC 636
LASC 362	LASC 653

VETERINARY MEDICAL PREPARATION (Pre-Veterinary)

Preparation for admission to the School of Veterinary Medicine, North Carolina State University, is offered through the program leading to the bachelor of science degree in Laboratory Animal Science at North Carolina Agricultural and Technical State University.

After satisfactory completion of specific undergraduate course requirements the major in laboratory animal science and agricultural science (animal science) are eligible to apply for admission to veterinary school (see major advisor).

COURSES WITH DESCRIPTION IN ANIMAL SCIENCE

ANSC-110. Science of Animals that Serve Mankind Credit 3(3-0)

A study of the fundamental principles of animal science for students not majoring in the animal sciences. Emphasis will be on the role of animals that serve mankind. Offered in the Spring.

ANSC-111. Introduction to Animal Science Credit 3(2-2)

A study of the application of basic sciences - animal genetics, physiology, nutrition and disease control - to improve dairy, livestock and poultry production, processing and merchandising. Offered in the Fall and Spring.

ANSC-212. Applied Nutrition and Feeding Credit 3(3-0)

Introduction to principles of nutrition on a comparative species basis, composition of feeds and principles of feeding. Prerequisite: ANSC 111. Offered in the Spring.

ANSC-214. Agricultural Genetics Credit 3(2-2)

A study of the basic principles of heredity in relation to animal and plant improvement. Laboratory work dealing with the cytological and genetically basis of inheritance. Prerequisites: BIOL 101, BIOL 240 or BIOL 160. Offered in the Fall.

- ANSC-217. Anatomy and Physiology of Farm Animals** **Credit 3(2-2)**
Study of functions and structures of the body systems and organs of domestic animals. Prerequisites: ANSC 111, BIOL 160. Offered in the Spring.
- ANSC-311. Livestock Production** **Credit 3(2-2)**
Selection, breeding, feeding, housing and general management of beef cattle, sheep and swine. Prerequisite: ANSC 212. Offered in the Spring.
- ANSC-312. Meat and Meat Products** **Credit 3(2-2)**
Introduction of meats from the standpoint of the consumer, processor and producer. Emphasis on meat as a food; inspection, grading, processing, preservation and identification. Offered in the Fall.
- ANSC-313. Livestock Evaluation** **Credit 1(0-3)**
Study of correlation of type, grade, degree of finish and other factors in the live animals with carcass grade, yield and value in cattle, sheep and swine. Objective and subjective selection of herd replacements. Prerequisite: Junior standing. ANSC 111. Offered in the Fall.
- ANSC-316. Swine Production and Management** **Credit 3(2-2)**
Aspects of developing and managing swine production facilities are studied practices for the commercial swine producer are emphasized. Areas of study include nutrition, reproduction, health, breeding, marketing and the economics related to swine production. Prerequisite: ANSC 111. Offered in the Spring.
- ANSC-413. Sanitation and Diseases of Farm Animals** **Credit 2(2-0)**
Sanitation and the common diseases of livestock with reference to causes, prevention and treatment and their relation to the environment. Offered in the Spring only.
- ANSC-611. Principles of Animal Nutrition** **Credit 3(3-0)**
Fundamentals of modern animal nutrition including classification of nutrients, their general metabolism and role in productive functions. Offered in the Spring only.
- ANSC-613. Livestock and Meat Evaluation** **Credit 2(1-2)**
Selection and evaluation of desirable animals in both market and breeding classes. Identification and evaluation of wholesale and retail cuts of meat. Prerequisites: ANSC 312 and 313. Offered alternating Summers.
- ANSC-614. Animal Breeding** **Credit 3(3-0)**
Application of genetic and breeding principles of livestock production and improvement. Phenotypic and genotypic effects of selection methods and systems of mating. Prerequisites: ANSC 111 and 214. Offered in the Spring.
- ANSC-615. Selection of Meat and Meat Products** **Credit 3(2-2)**
Identification, grading and cutting of meats. Offered in alternating Summers.
- ANSC-618. Seminar in Animal Science** **Credit 1(1-0)**
A review and discussion of selected topics and recent advances in the fields of animal and food science. Prerequisite: Senior standing. Offered in the Spring.
- ANSC-619. Special Problems in Livestock Management** **Credit 3(3-0)**
Special work in problems dealing with feeding, breeding and management in the production of beef cattle, sheep and swine. Prerequisite: Senior standing. Offered in the Fall.
- ANSC-624. Physiology of Reproduction in Vertebrate Species** **Credit 3(2-2)**
(Formerly 617)
Study of reproductive processes including anatomy, physiology and endocrinology. Semen production, artificial insemination and hormonal studies. Prerequisite: ANSC 461 or ANSC 623 or permission of instructor. Offered in alternating Falls.

ANSC-713. Advanced Livestock Production**Credit 3(2-2)**

Review of research relating to various phases of livestock production; fitting the livestock enterprise into the whole farm system. Special attention to overall economic operation. Offered in the Fall.

COURSES IN DAIRY SCIENCE**ANSC-321. Dairy Cattle Production****Credit 3(2-2)**

Management and selection for efficient milk production. Lactation, care of dairy equipment, use of records and housing of dairy cattle. Prerequisite: ANSC 212. Offered in the Fall.

ANSC-323. Dairy Cattle Evaluation**Credit 1(0-2)**

Characteristics of dairy breeds, comparative judging, selection of dairy cattle, sire selection and pedigrees. Prerequisite: ANSC 111. Offered in the Spring.

ANSC-340. Milk and Milk Products**Credit 3(2-2)**

Study of the chemistry of milk, milk processing, milk products and quality. Prerequisite: CHEM 102 or 107. Offered in the Spring.

ANSC-629. Special Problems in Dairy Management**Credit 3(3-0)**

Special work in problems dealing with dairy production. Prerequisite: Senior standing. Offered in the Spring only.

ANSC-536. Food Plant Management**Credit 2(1-2)**

Organization and management of food plants. Procurement of raw material supplies, plant layout, equipment for plants, distribution of products, costs of operation, and record keeping. Offered in the Fall.

ANSC-541. Food Packaging**Credit 2(2-0)**

Characteristics of packaging materials, strength, elasticity, permeability, food packaging machines, adhesives, as related to product wholesomeness and package design as a form of advertising. Prerequisite: CHEM 102 or 107. Offered in the Fall.

COURSES IN POULTRY SCIENCE**ANSC-351. Poultry Production****Credit 3(2-2)**

Practices and principles of poultry production. Prerequisite: ANSC 111. Offered in the Fall.

ANSC-354. Fundamentals of Poultry Breeding**Credit 4(3-2)**

Breeding and selection and improvement of stock. Prerequisites: ANSC 214 and ANSC 351. Offered in alternating Springs.

ANSC-555. Incubation and Hatchery Management**Credit 4(2-4)**

Management of poultry farm and hatchery operation. Prerequisite: ANSC 351. Offered in the Spring.

ANSC-556. Processing and Marketing of Poultry Products**Credit 3(2-2)**

Methods of killing, dressing, grading and storage of poultry meats and the grading and storage of eggs. Transportation of poultry products and factors influencing price. Offered in the Spring.

**ANSC-641. Disease Management of Livestock and Poultry
(Formerly 553)****Credit 3(2-2)**

Poultry hygiene; causes of diseases; symptoms and control of diseases and parasites. Prerequisite: ANSC 351. Offered in the Fall.

ANSC-657. Poultry Anatomy and Physiology**Credit 3(2-2)**

A course which deals with the structure and function of tissues, organs, and systems of the domestic fowl. Prerequisite: ANSC 351. Offered in alternating Spring and Summers.

ANSC-659. Special Problems in Poultry**Credit 3(3-0)**

Assignment of work along special lines in which a student may be interested, given largely by project method for individuals in Poultry Science. Prerequisite: Three advanced courses in Poultry Science. Offered in the Fall.

LABORATORY ANIMAL SCIENCE**LASC-161. Orientation I****Credit 1(1-0)**

A general orientation to college academic life with consideration for program demands, learning techniques and resources.

LASC-162. Introduction to Laboratory Animal Science**Credit 3(3-0)**

An introduction to the field of Laboratory Animal Science which includes ethical considerations, history of use, laws and guidelines associated with use of laboratory animals.

LASC-261. Medical Terminology**Credit 3(3-0)**

An introduction to medical terminology with emphasis on vocabulary building using Latin and Greek prefixes, suffixes, word roots and combining forms.

LASC-262. Advanced Laboratory Animal Science**Credit 3(3-0)**

Advanced study in the field of Laboratory Animal Science as it relates to the management, health, basic science and husbandry of many of the less common laboratory animal species. Principles of laboratory animal nutrition, euthanasia, anesthesiology, pharmacology and surgical techniques will be discussed. Prerequisite: ANSC 162.

LASC-361. Integrated Anatomy**Credit 4(3-3)**

Origin, development, and structure of bio-systems in laboratory animals, food animals and companion animals. Prerequisite: ANSC 162.

LASC-362. Microscopic Anatomy**Credit 3(2-3)**

Microscopic studies of cells and tissues of laboratory animals, food animals and companion animals. Prerequisite: ANSC 361.

LASC-363. Internship I**Credit 6(6-0)**

On campus preparation and field experiences with Laboratory Animal Sciences activities. Prerequisites: Junior standing and special departmental permission.

LASC-365. Biology, Diseases and Care of Laboratory Animals**Credit 4(3-3)**

The biology, diseases and care of laboratory animals used in research, teaching, and testing. Study of behavior of common laboratory animals; handling, restraint; necropsy and diagnostic procedures: anesthesia, aseptic surgical.

LASC-461. Physiology of Domestic Animals**Credit 3(2-3)**

Study of function of bio-systems in laboratory, animals farm and companion animals. Prerequisite: ANSC 361.

LASC-462. Principles of Medical Science**Credit 3(3-0)**

Discussion of basic topics which provide insight to causative agents in disease and resultant biological reactions, economic losses, and decrease performance levels. Prerequisite: BIOL 121.

LASC-463. Internship II**Credit 6(6-0)**

Field experiences in Veterinary Medical activities. Prerequisites: ANSC 363 and special departmental permission.

- LASC-464. Types and Breeds of Food Animals** **Credit 3(3-0)**
A study of the origin, characteristics, behavior and identification of major breeds and types of food animals.
- LASC-465. Types and Breeds of Companion Animals** **Credit 3(3-0)**
A study of the origin, characteristics, behavior and identification of major breeds of companion animals.
- LASC-466. Types and Breeds of Laboratory Animals** **Credit 3(3-0)**
A study of the origin, characteristics, behavior, and identification of major breeds of laboratory animals.
- LASC-564. Introduction to Research** **Credit 3(2-3)**
An introductory course in biomedical research techniques including the fundamental of laboratory investigations, precepts of the scientific method and experimental design, and the application of scientific instrumentation. Prerequisite: Senior standing.
- LASC-569. Seminar in Laboratory Animal Science** **Credit 1(1-0)**
Discussion of Current Topics in Laboratory Animal Science or Histotechnology.
- LASC-636. Environmental Toxicology** **Credit 3(2-3)**
General principles involved, in the absorption, distribution, and excretion of toxicants, including their biotransformation. Adverse effects, and factors that modify their effects will be studied. The toxic effects on specific target organs will also be studied.
- LASC-653. Laboratory Animal Management and Clinical Techniques**
(Formerly 563) **Credit 4(2-6)**
Principles, theories and current concepts of laboratory animal science will be discussed. Topics included will be government regulations, ethical considerations, animal facility management and animal health surveillance. Prerequisite: Permission of instructor. Offered in the Spring.
- LASC-660. Special Techniques in Specimen Preparation,
Immunological Techniques, Electron Microscopy,
Radiology or Histotechnology** **Credit 3(1-6)**
The preparation of animal models for classroom, museum, and special display purpose. Prerequisite: Senior standing or special departmental permission.

DIRECTORY OF FACULTY

George A. Johnson, M.S., Cornell University; DVM., Tuskegee Institute, Professor and Chairperson

John Allen, B.S., University of Georgia; M.S., Ph.D., University of North Carolina

Doris Fultz, B.S. Virginia Commonwealth University; B.S., DVM, Tuskegee Institute; Associate Professor

Tracy L. Hanner, B.S., North Carolina Central University; DVM North Carolina State University

Jill M. Henson-Upshaw, B.S., Tuskegee Institute; D.V.M., Tuskegee University, Assistant Professor

David Libby, B.S., Ph.D., University of Maine; Associate Professor

Ray McKinnie, B.S., North Carolina A&T State University; M.S., Ohio State University, Ph.D., N.C. State University, Agricultural Extension Faculty

Linda M. Soler Niedziela, B.S., University of Pittsburgh; Ph.D. West Virginia University; Adjunct Associate Professor

Lanell Ogden, B.S., Fort Valley State College; DVM, Tuskegee University; M.S., Oklahoma State University; Ph.D., Auburn University

Derek Norford, B.S., North Carolina A&T State University; DVM, Tuskegee University; M.S., North Carolina State University; Ph.D. Candidate, NC State University

Edward C. Segerson, B.S., M.S., Memphis State University; Ph.D., North Carolina State University; Associate Professor

Willie Willis, B.S., Fort Valley State College; M.S., Ph.D., Colorado State University; Associate Professor

Department of Human Environment and Family Sciences

Rosa Purcell, Chairperson

OBJECTIVES

The objectives of the Human Environment and Family Sciences Department are:

1. To develop satisfying personal, group and family relationships as a basis for active participation in a democratic society;
2. To understand the enrichment of home and family living through the appreciation and use of art and advances in science and technology;
3. To develop an understanding and appreciation of varying cultural backgrounds; and
4. To prepare the individual for gainful employment in one of the major areas of the profession.

DEGREES OFFERED

Fashion Merchandising and Design — B.S.

Food and Nutrition (including Dietetics) — B.S.

Home Economics Education — B.S.

Child Development: Early Education and Family Studies — B.S.

Food Science — B.S.

*Food and Nutrition — M.S.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the Human Environment and Family Sciences Department is based upon the general admission requirements of the University.

**See Graduate Bulletin for graduate program requirements.*

DEPARTMENTAL REQUIREMENTS

Majors in Human Environment and Family Sciences and Food Science and all of the concentrations must complete the required programs of course work. A minimum grade of "C" is expected in all courses and required in all major courses for graduation.

ACCREDITATION

The Human Environment and Family Sciences Department is nationally accredited by the American Association of Family and Consumer Sciences.

The Home Economics Teacher Education program is accredited by the National Council for Accreditation of Teacher Education and approved by the North Carolina State Department of Public Instruction under the University-wide accreditation and approval of teacher education programs.

The Dietetic Program is currently granted Plan IV Approval by the American Dietetic Association Council on Education, Division of Education Accreditation/Approval, a specialized accrediting body recognized by the Council on Postsecondary Accreditation and the United State Department of Education.

CAREER OPPORTUNITIES

The programs in the Human Environment and Family Sciences Department prepares student for careers in child development, fashion merchandising and design, nutrition dietetics, food science, teaching of home economics in junior and senior high schools, extension services, consumer services and public relations.

CURRICULUM GUIDE FOR THE MAJOR IN CLOTHING AND TEXTILE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
HIST ²	3	HIST ²	3
GCST 133	3	HEFS 123	3
HEFS 101 ¹	1	TECH 233	<u>3</u>
HEFS 122	<u>2</u>		16
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL ³	3	ENGL ³	3
CHEM 100	3	PHYS 110	2
CHEM 110	1	PHYS 111	1
BUED 334	3	ART 224 OR	2
HEFS 321	3	ART 225	
GCST 234	<u>3</u>	SPCH 250	3
	16	PSYC 320 ⁴	3
		MATH 224	<u>3</u>
			17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 614 ¹	2	HEFS 615 ¹	2
HEFS 424	3	HEFS 422	3
GCST 430	3	GCST 631	3
HEFS 250	3	GCST 635	3
SOCI 200 OR	3	HEFS 520	3
SOCI 300		HEFS 523	<u>3</u>
ECON 300 OR	3		17
ECON 301			
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHED 200	2	HEFS 432	3
GCST 230	3	HEFS 437	3
HEFS 429	3	HEFS 525	3
HEFS 310	3	HEFS 680	3
HEFS 612 ¹	<u>3</u>	Electives	<u>3</u>
	14		15

Total Credit Hours: 128

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

CURRICULUM GUIDE FOR THE MAJOR IN CHILD DEVELOPMENT

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100 ²	3	HIST 101 ²	3
HEFS 101 ¹	1	CHEM 100	3
EASC 201	3	CHEM 110	1
PHED 200	<u>2</u>	PHED 229	1
	15	SPCH 250	<u>3</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200 ³	3	ENGL 201 ³	3
BUED 334	3	HEFS 311	3
HEFS 310	3	CUIN 301	2
SOCI 300	3	HEFS 401	3
CUIN 300	2	HEFS 418	3
PSYC 320	<u>3</u>	HEFS 403	<u>3</u>
	17		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 430	3	HEFS 615 ¹	2
HEFS 414	3	HEFS 632	3
SPCH 319	3	CUIN 436	3
CUIN 400	3	CUIN 611	3
HEFS 614 ¹	2	HDSV 350	3
Elective	<u>3</u>	HEFS 600	<u>3</u>
	17		17

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 308	3	HEFS 612 ¹	3
HEFS 419	3	HEFS 634	3
HDSV 536	3	HEFS 619	<u>6</u>
HEFS 639	3		12
PHED 442	<u>2</u>		
	14		

Total Credit Hours: 126

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

CURRICULUM GUIDE FOR THE MAJOR IN HOME ECONOMICS EDUCATION

Freshman

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST ²	3	HIST ²	3
HEFS 101 ¹	1	HEFS 123	3
HEFS 122	2	PHED 101	1
HEFS 130	3	BIOL 100	4
	<u>15</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 100 or	3	CHEM 106	3
SOCI 200		CHEM 116	1
ENGL ³	3	ENGL ³	3
HEFS 321	4	HEFS 331	2
PHED 200	2	SPCH 250	3
CUIN 300	2	CUIN 301	2
Electives	3	Electives	4
	<u>17</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 400	3	HEFS 615 ¹	2
HEFS 300	3	HEFS 403	3
CUIN 436	3	PSYC 320	3
HEFS 614 ¹	2	HEFS 310	3
HEFS 503	3	HEFS 500	3
ECON 300 or	3	HEFS 679	3
ECON 301			<u>3</u>
	<u>17</u>		<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 612 ¹	3	HEFS 604	3
HEFS 401	3	CUIN 560	6
HEFS 505	3	CUIN 637	3
CUIN 528	3		<u>12</u>
CUIN 400	3		
	<u>15</u>		

Total Credit Hours: 128

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

CURRICULUM GUIDE FOR THE MAJOR IN FOOD SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
HIST ²	3	HIST ²	3
BIOL 100 or BIOL 160	4	BUAD 220	3
PHED 101	1	PHED 102	1
HEFS 1011	1	SPCH 250	3
	<u>16</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 101	3	CHEM 102	3
CHEM 111	1	CHEM 112	1
ENGL ²	3	ENGL ²	3
HEFS 236	3	HEFS 337	3
AGEC 240	3	AGEC 330	3
PHYS 110	2	MATH 224	3
PHYS 111	1		<u>3</u>
	<u>16</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 121	4	BUAD 422	3
ANSC 312 or ANSC 340	3	HEFS 615 ¹	2
CHEM 221	3	HEFS 638	3
CHEM 223	2	CHEM 222	3
HEFS 631	3	CHEM 224	2
HEFS 614 ¹	2	ANSC 351 or ANSC 556	3
	<u>17</u>	HEFS 638	<u>3</u>
			<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 643	3	HEFS 633	3
HEFS 612	3	ANSC 536	3
BIOL 420	1	HEFS 310	3
CHEM 251	2	BUAD 430	3
CHEM 252	1	PLSC 522	3
ANSC 618	1		<u>3</u>
PLSC 622	3		<u>15</u>
	<u>14</u>		

Total Credit Hours: 127

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

CURRICULUM GUIDE FOR THE MAJOR IN FOOD AND NUTRITION/DIETETICS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
SOCI 100 ²	3	SOCI ²	3
MATH 111	4	MATH 112	4
PHED	1	PHED	1
HEFS 101 ¹	1	ENGL ²	3
BIOL 100	4	HEFS 130	3
	<u>16</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 106	3	CHEM 107	3
CHEM 116	1	CHEM 117	1
HEFS 236	3	BIOL 361	4
PSYC 320	3	HEFS 346	3
ENGL ²	3	HEFS 337	3
AGEC 446	3	BUAD 341	3
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 310 ¹	3	CHEM 251	3
HEFS 334	3	CHEM 252	1
BIOL 220	4	MATH 224	3
CHEM 221	3	SOCI 302	3
CHEM 223	2	HEFS 332	4
HDSV 435	3	Free Elective	3
	<u>18</u>		<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 632	3	HEFS 338	3
HEFS 630	3	HEFS 648	3
ENGL 331	3	HEFS 544	3
BUED 360	3	HEFS 514 ¹	3
HEFS 679	3	HEFS 646	3
	<u>12</u>		<u>15</u>

Total Credit Hours: 128

¹ HEFS Core Courses

² SOSC & ENGL (HUMA) student's choice

CURRICULUM GUIDE FOR THE MAJOR IN FOOD ADMINISTRATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
SOSC 100	3	SOCO Elective	3
MATH 111	4	MATH 112	4
PHED	1	PHED	1
HEFS 101	1	ENGL HUMA	3
BIOL 100	4	HEFS 130	3
	<u>16</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 106	3	CHEM 107	3
CHEM 116	1	CHEM 117	1
BUAD 341	3	BIOL 361	4
HEFS 236	3	HEFS 346	3
PSYC 320	3	HEFS 337	3
ENGL	3	BUAD 422	3
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 338	3	CHEM 251	3
HEFS 334	3	CHEM 251	1
BIOL 220	4	MATH 224	3
CHEM 221	3	HEFS 332	3
CHEM 223	2	HEFS 345	3
	<u>15</u>	HEFS 448	4
			<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 632	3	HEFS 439	3
HEFS 630	3	HEFS 648	3
HDSV 435	3	HEFS 679	3
ENGL 331		HEFS 614	2
BUED 360	3	Elective student's choice	3
HEFS 310	3		<u>14</u>
	<u>15</u>		

Total Credit Hours: 127

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

**CHILD DEVELOPMENT
EARLY EDUCATION AND FAMILY STUDIES (BIRTH-KINDERGARTEN)
TEACHING CERTIFICATION FOCUS**

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
HEFS 101 ¹	1	CHEM 100	3
BIOL 100	4	CHEM 110	1
PHED 200	2	PHED 229	1
	<u>16</u>	SPCH 250	3
			<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 310	3	ENGL 201	3
BUED 334	3	HEFS 311	3
ENGL 200	3	CUIN 301	2
SOCI 300	3	HEFS 401	3
CUIN 300	2	HEFS 418	3
PSYC 320	3	PHED 442	2
	<u>17</u>	Electives	2
			<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 430	3	HEFS 419	3
HEFS 414	3	HEFS 632	3
SPCH 319	3	CUIN 436	3
CUIN 400	3	CUIN 611	3
HEFS *614 ¹	2	HDSV 350	3
	<u>14</u>	HEFS 600	3
			<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS *612 ¹	3	HEFS 634	3
HSDV 536	3	HEFS 560	6
HEFS 639	3	Electives	3
MUSI 609	3		<u>12</u>
Electives	3		
	<u>15</u>		

Total Credit Hours: 127

¹ HEFS Core Courses

² HIST student's choice

³ ENGL (HUMA) student's choice

COURSES WITH DESCRIPTION IN HUMAN ENVIRONMENT AND FAMILY SCIENCES

HEFS-101. Introduction to Human Environment and Family Sciences Credit 1(1-0)

A course designed to assist students in making personal adjustment to college living, an introduction to the broad areas of home economics; a study of the home economics curricula and professional opportunities in the field. Required of all home economics majors.

HEFS-104. The Individual and His Family in Contemporary Society Credit 3(3-0)

Individual development in the family. The changing needs and roles of individuals due to emerging social forces. The role of the Human Environment and Family Sciences professional in developing strategies for successful families.

HEFS-105. Etiquette in Today's Society Credit 1(1-0)

An overview of the role of etiquette in today's world, emphasizing planning, preparation and execution for special occasions.

HEFS-122. Clothing in Contemporary Environment Credit 2(2-0)

A basic study of the social, psychological, and economic influences on contemporary fashion; the selection, care and maintenance of apparel of the family.

HEFS-123. Textiles Credit 3(2-2)

An introduction to the study of textiles, their sources, characteristics and production; the performance, use and care of fabrics.

HEFS-130. Food Preparation Credit 3(1-4)

Basic principles and techniques used in food preparation and preservation to develop skills in planning, preparation, and serving nutritious meals for the family.

HEFS-133. Family Food Credit 3(2-2)

A study of the application of elementary principles of nutrition and cookery to the planning, preparation and serving of simple meals designed to meet the needs of all family members.

HEFS-135. Food and Man's Survival Credit 3(3-0)

Acquaint students with the most common information regarding foods, nutrition and health, with attempts to dispel misconceptions about food properties and factors affecting the quality of foods. Areas of discussion include man's struggle for foods; chemical additives and food safety; modern food preservation, organic and health foods; nutrition and the consumer.

HEFS-200. Introduction to Home Economics Education Credit 2(2-0)

Historical background, philosophy and objectives of education in the United States; educational, social and political movements affecting vocational education in the public schools with emphasis on the requirements of North Carolina.

HEFS-236. Introduction to Food Science Credit 3(2-2)

An introductory study of the nature of raw foods and behavior of food components during handling and processing. Key methods and principles of food preservation will also be discussed.

HEFS-250. Introduction to Fashion Merchandising Credit 3(3-0)

An introduction to the apparel business. Discussion of current trends in fashion merchandising, fashion coordination and analysis of the function of fashion merchandising.

HEFS-300. Program Planning in Home Economics K-12 Credit 3(3-0)

Planning home economics programs for occupational education in public schools K-12. (Career awareness, middle school, exploratory, comprehensive occupational home economics, youth and adult program.)

- HEFS-310. Introduction to Human Development** **Credit 3(3-0)**
Introduction to the life span, prenatal, childhood, adolescence, adulthood, aging and death, as a developmental process. The social psychological, cognitive, physical, and moral characteristics of each stage are studied.
- HEFS-311. Child Development: Prenatal Through Early/Middle Childhood** **Credit 3(2-2)**
A study of the child's sequential development at different stages - conception through late childhood. Historical and theoretical approaches to child development programs for young children. Field experiences are required.
- HEFS-312. Adolescence and Young Adulthood** **Credit 3(3-0)**
A comprehensive study of the physical, mental, and psychological factors of development from late childhood through adulthood. Observation required. Prerequisite: Instructor's permission.
- HEFS-313. Adulthood** **Credit 3(3-0)**
Study of the unique characteristics of life in the middle and later years. Analysis of the aging process. Special emphasis on physical, intellectual, personal, family, social and psychological development in the middle and later years. Impact of the economical and political process will be included. Prerequisite: SOCI 100.
- HEFS-314. Human Ecology of the Family** **Credit 3(3-0)**
The family as environment and within environment. Relations of values, goals, standards, and decision-making in the management of the family. The unique role of the family in the social, economics, and political systems. Prerequisite: SOCI 100.
- HEFS-321. Basic Clothing Construction and Evaluation** **Credit 3(1-4)**
Fundamental principles of clothing construction using the commercial pattern. Emphasis will be on fitting, pattern adjustments, garment and basic construction skills. Laboratory experiences required.
- HEFS-331. Meal Management** **Credit 2(1-2)**
Consideration of the management of human and physical resources in the planning, preparing and serving of meals to meet the needs of families of varying sizes, incomes and ages. Prerequisites: HEFS 130.
- HEFS-332. Cultural Aspects of Food** **Credit 2(2-0)**
A study of the influence of cultural and socio-economics factors on food patterns and nutritional status of selected ethnic groups.
- HEFS-337. Introduction to Human Nutrition** **Credit 3(2-2)**
An introductory approach to the principles of nutrition as they relate to human requirements for food nutrients; significance and mechanism through which nutrients meet these biological needs during the life cycle. Prerequisites: CHEM 105, 115 and 461.
- HEFS-338. Diet Therapy** **Credit 3(2-2)**
A study of the organization, management and administration of food service establishments.
- HEFS-344. Institution Organization and Management I** **Credit 3(3-0)**
A study of the organization, management and administration of food service establishments.
- HEFS-345. Institution Organization and Management II** **Credit 3(3-0)**
A Continuation of HEFS 344 with emphasis on personnel management.
- HEFS-346. Institution Purchasing** **Credit 3(2-2)**
A study of the problems involved in the purchase of food and other expendable supplies for food service establishments.

HEFS-400. Contemporary Housing**Credit 3(2-2)**

A study of problems in house planning to meet family needs. Emphasis is placed on the study of house designs, methods of financing and location.

HEFS-401. Family Systems**Credit 3(3-0)**

The development of the family and the impact of environmental systems on the life cycle as families move from stages of effective status to crisis status.

HEFS-403. Family Economics**Credit 3(3-0)**

Financial budgeting and planning strategies during the various stages of the family life cycle. Consideration is given to multifaceted consumer problems and resources for problem resolution.

HEFS-410. Practicum in Child Care**Credit 6(2-8)**

Six child care competencies are required for the Child Development Associate credential to be awarded by the National Consortium credentialing office. The student will demonstrate mastery of each competency. Prerequisite: Only Continuing Education students may enroll.

HEFS-414. Exploring Creative Expressions in Early Education**Credit 3(2-2)**

Materials, methods, and evaluations used in the development of cognitive, affective, and psychomotor behaviors in dramatic play, music, art, and literature will be the focus areas. In addition, career opportunities, in curricula and interagency services to assist families in a collaborative relationship will be emphasized. Field based teaching experiences are included in this course. Prerequisites: HEFS 310, 311, 418.

HEFS-415. Materials, Methods and Evaluation II**Credit 3(2-2)**

Materials, methods, and evaluations used in the development of cognitive, affective, and psychomotor behaviors. Focus areas: Social Studies, Science, Math, Health and Safety. Prerequisite: HEFS 414.

HEFS-416. Play Materials and Equipment for the Preschool Child**Credit 3(3-0)**

The importance of play in all aspects of child development as related to cognitive, affective, and psychomotor, behaviors. Plan materials, equipment, and their uses in a functional school environment will be explored. Prerequisites: HEFS 414, 415.

HEFS-417. Parent Education**Credit 3(3-0)**

Parental interactions in the child's development at home, in the school and in the community. The effective use of assistance and volunteers in the school environment. Elements of creative parenting in a rapidly changing social environment.

HEFS-418. Foundations of Early Education and Family Studies**Credit 3(3-0)**

The study of the historical, sociological, and philosophical background of typical and atypical development in young children; a review of the dynamics of the family, and current issues related to the teaching profession. Emphasis will be placed on curriculum planning, the integrated day, scheduling, and the curriculum environment. Field experiences are included in this course. Prerequisite: HEFS 310.

HEFS-419. Practicum in Community Service**Credit 3(1-4)**

Practical field experiences in community service agencies concerned with all areas of child care and family development. Emphasis will be placed on services to young children.

HEFS-420. Day Care Services**Credit 3(3-0)**

A student of the organization, administration, operation and licensing of day care services. Community personnel, services and facilities will be incorporated in the study of current issues related to day care. Field observation required. Prerequisite: HEFS 311.

- HEFS-421. The Cognitively Oriented Preschool Curriculum** **Credit 3(3-0)**
Methods, materials, and strategies in preschool education as found in the Cognitively Oriented Curriculum. Emphasis will be placed on development of skills in teaching.
- HEFS-422. Creative Dress Design I (Flat Pattern)** **Credit 3(2-2)**
The application of principles in dress design by methods of flat pattern making. Prerequisites: HEFS 122, 123, 321.
- HEFS-423. Contemporary and Traditional Methods of Tailoring** **Credit 4(1-6)**
The application of advanced construction and soft tailoring techniques toward the development of garments for personal use. Laboratory experiences will contrast the two techniques and emphasize the use of wool and other woven fabrics. Prerequisites: HEFS 122, 123, 321, or consent of instructor.
- HEFS-424. Historic Developments of Costume and Textiles** **Credit 3(3-0)**
An introduction to the study of costume and textiles from ancient to modern times. Prerequisites: HEFS 122, 123.
- HEFS-425. Fashion Motivation** **Credit 3(3-0)**
The study of the interaction of the social, psychological, and economic aspects of dress. Prerequisites: HEFS 424; PSYC 320; ANTH 200 or 300.
- HEFS-426. Problems in Clothing** **Credit 3(3-0)**
Independent study in special problems in selected areas of clothing. Prerequisite: Permission of instructor. Prerequisites: HEFS 403, 424, 425 or permission of instructor.
- HEFS-427. Problems in Textiles** **Credit 3(3-0)**
Independent study in special problems in selected areas of textiles. Prerequisite: Permission of instructor.
- HEFS-429. Creative Dress Design II (Draping)** **Credit 3(2-2)**
The application of artistic principles in creating dress design by methods of draping. Laboratory experiences are included. Prerequisites: HEFS 422, 424.
- HEFS-430. Observation and Evaluation of Behavior for Infants and Young Children** **Credit 3(3-0)**
A study of the principles and practices of observing, recording and analyzing behavior and development of young children. Attention is focused on naturalistic observations: developmental theories, diagnostic information, and an analysis of interpreting play, language and physical development of young children. Field experiences as included in this course. Prerequisites: HEFS 310, 311, 418.
- HEFS-432. Global Trends and National Perspectives in Clothing and Textiles** **Credit 3(3-0)**
An in depth investigation of the influences of cultural and socio-economics factors on clothing and textiles. Cultural dress patterns are investigated. Prerequisites: HEFS 122, 321, 250.
- HEFS-437. Cooperative Training in Industry I** **Var. Credit (1-6)**
Student must be in industry full time one semester or summer in his major field of work, and complete the University Co-op requirements. He will be evaluated on reports from industry and a University coordinator. Twelve credit hours is the maximum to be earned in the Co-op arrangement that can be used as electives toward degree programs in the School of Agriculture.
- HEFS-439. Clinical Nutrition** **Credit 3(2-2)**
Principles of nutritional sciences in the treatment and management of nutrition related diseases. Focus on etiology, prevalence, pathophysiology and nutritional care of these health problems. Prerequisites: CHEM 251, 252, and 337.

- HEFS-447. Institution Equipment** **Credit 3(1-4)**
 A study of the selection, care and use of equipment for quantity food preparation and service. Interpretation of blueprints and specifications will be considered.
- HEFS-448. Quantity Cookery** **Credit 4(1-6)**
 The application of the principles of cookery to the preparation and service of food for group feeding with emphasis on menu planning, work schedules, cost and portion control. Prerequisite: HEFS 130.
- HEFS-500. Occupational Home Economics** **Credit 3(1-4)**
 Organization and administration of occupational wage-earning programs at the upper high school level-methods and instructional media. Work experiences required in at least one area of home economics occupational cluster.
- HEFS-503. Concepts in Esthetic Ecology** **Credit 3(2-2)**
 A study of housing and interior requirements for individuals and families with a focus on plans, designs, furnishings and aesthetics.
- HEFS-505. Home Management and Equipment** **Credit 3(1-4)**
 The use of management principles in effecting an orderly management of the home and all of its environment. The use of basic equipment in the home that makes for an efficient and well kept household will be emphasized. Selection and coordination of equipment for effective living is demonstrated.
- HEFS-520. Visual Merchandising and Promotion** **Credit 3(3-0)**
 Use of visual merchandising techniques for nontextile and textiles products and services through physical manipulation and design principles. Prerequisites: HEFS 122, 321, and 250.
- HEFS-521. Field Experience** **Credit 4(0-8)**
 A course designed to give the student practical experiences in the area of clothing, or fashion merchandising. Prerequisites: HEFS 321, 403; BUAD 360.
- HEFS-522. Food Engineering** **Credit 3(2-2)**
 Fundamentals of heat transfer, fluid flow, refrigeration, evaporation and other unit operations in the food processing industry. Application of engineering principles and concepts to the processing of foods. Prerequisite: PHYS 201 or 225.
- HEFS-523. Problems in Merchandising of Apparel** **Credit 3(3-0)**
 Independent study of special problems in selected areas of fashion merchandising. Conference hours to be arranged. Prerequisites: HEFS 122, 424, 250, and GCST 234.
- HEFS-525. Fashion Marketing and Merchandising** **Credit 3(3-0)**
 Emphasis is placed on the functions and responsibilities of the fashion merchandiser, considering various retail establishments. A synthesis of business knowledge and its application to the fashion field.
- HEFS-541. Food Packaging** **Credit 2(2-0)**
 Characteristics of packaging materials, strength, elasticity, permeability, food packaging machines, adhesives, as related to product wholesomeness and package design as a form of advertising. Prerequisite: CHEM 102 or 107.
- HEFS-544. Field Experience in Food Administration** **Credit 3(0-6)**
 Individualized experiences in off-campus food service establishments.
- HEFS-547. Cooperative Training in Industry II** **Var. Credit (1-6)**
 The description of this course is the same as HEFS 437, and is normally the second Co-op experience of the student.

HEFS-549. Food Consultation for Older Adults**Credit 3(3-0)**

Techniques of consultation with older adults and providers of services to older adults on diets, food choices, food fads, planning, purchasing, and preparational procedures. Menus for limited incomes will be emphasized.

HEFS-600. Approaches to Developmental Curricula**Credit 3(2-2)**

A review of various approaches and alternatives to preschool curriculum as it relates to developmental learning patterns; the nature of knowledge, societal forces and interagency services. Also to develop an understanding of learning principles, developmentally appropriate resources, and various educational strategies that can be organized to support an effective environment for young children. Special emphasis will be placed on screening and assessment procedures, formulating objectives, and strategies for working with professional team members. Laboratory experience are required.

HEFS-603. Special Problems in Family and Consumer Sciences**Credit 3(1-4)**

Problems in the various areas of home economics may be chosen for individual study.

HEFS-604. Seminar in Home Economics Education**Credit 3(3-0)**

Consideration of problems resulting from the impact of social change on the various fields of Human Environment and Family Sciences, review of research and professional development.

HEFS-605. Human Environment and Family Sciences**Summer Study Abroad****Credit 6(0-12)**

A course designed to provide opportunity for students and specialists to study historic and contemporary points of interest abroad. Exposure to customs, cultures and industries in an international setting will provide the basis for broader background and experiences in selected areas of home economics.

HEFS-606. Cooperative Extension**Credit 3(3-0)**

Introduction to the organization, philosophy, financing, personnel, clientele, and programs of Cooperative Extension Service.

HEFS-607. Cooperative Extension - Field Experience**Credit 3(0-6)**

Field experience to provide opportunity for students to become acquainted with the role of county personnel, office organization and programs in Cooperative Extension Service.

HEFS-608. Teaching Adults and Youth in Out-of-School Groups**Credit 3(0-6)**

The design and development of informal educational programs for youth and adults in out-of-school settings. Prerequisite: HEFS 606.

HEFS-612. Senior Seminar**Credit 3(3-0)**

Student review and presentation of major research findings in the various disciplines of home economics. (Required of Human Environment and Family Sciences majors.) Prerequisite: Senior year only.

HEFS-613. Substance Abuse**Credit 3(3-0)**

Alcoholism and drugs and their inherent effects upon the family and society. Problems in the family, related to the individuals, business and industry. Additional focus will be given to treatment, agencies and methods of recovering self-esteem.

HEFS-614. An Integrative Approach to Family and**Consumer Sciences I****Credit 2(2-0)**

Contemporary issues of family system in relation to integrating concepts of child development, food and human nutrition, and resource management within the environment will be studied. (Required of all Human Environment and Family Sciences majors.)

HEFS-615. An Integrative Approach to Family and**Consumer Sciences II****Credit 2(2-0)**

Contemporary issues of family systems in relation to integration of concepts of clothing and fashion design, home economics education, food science and resource management within the environment. (Required of all Human Environment and Family Sciences majors.)

HEFS-618. Food Technology Seminar**Credit 1(1-0)**

A review and discussion of selected topics and recent advances in the fields of animal and food science. Prerequisite: Senior standing.

HEFS-619. Internships**Credit 6(1-10)**

The application and practice of methods, techniques, and materials of field-based experiences in infant/toddler programs, intermediate care programs, hospitals, preschools, shelters and various family service agencies. These internships will include observation and field-based experiences under supervision. A minimum of one hundred twenty hours (120) clock hours are required during internship experiences. Prerequisites: HEFS 419, 614, 615, HDSV 536.

HEFS-626. Tailoring**Credit 4(2-4)**

A study of the principles of hard tailoring with emphasis on comparing the various methods and analyzing tailored garments.

HEFS-630. Advanced Nutrition**Credit 3(3-0)**

Intermediate metabolism and interrelationships of organic and inorganic food nutrients in human biochemical functions. Prerequisites: Home Economics 337; CHEM 251, 252 or equivalent.

HEFS-631. Food Chemistry**Credit 3(2-2)**

A study of food components, their interaction and reactions with emphasis on biochemical changes in fruits and vegetables on post harvest storage, postmortem biochemical changes in meat and fish, browning reactions, lipid oxidation and other chemical alterations in foods.

Prerequisite: HEFS 236.

HEFS-632. Maternal and Development Nutrition**Credit 3(3-0)**

Maternal nutrient requirements and feeding practices at various phases of growth periods. Influences of nutrition on growth and development of preschool and early elementary children. Focus on nutrition, learning and growth assessments. Guidelines to assess the nutritional quality of the food and physiological developments.

HEFS-633. Food Analysis**Credit 3(1-4)**

Fundamental chemical, physical and sensory aspects of food composition as they related to physical properties, acceptability and nutritional values of foods. Prerequisites: CHEM 102, 112; HEFS 236.

HEFS-634. Seminar in Early Education and Family Studies**Credit 3(3-0)**

A synthesis of selected research for individual and group study, using projects, workshops, and colloquia. The focus of the research may be an in-depth study of material previously investigated or explored in early education, family studies, teacher preparation, and developmental learning. Prerequisites: HEFS 418, 614, 615 HDSV 536.

HEFS-635. Introduction to Research Methods in Food and Nutrition**Credit 3(0-6)**

Laboratory experiences in the use of methods applicable to food and nutrition research. Prerequisite: Consent of the instructor.

HEFS-636. Food Promotion**Credit 4(1-6)**

A course which gives experiences in the development and testing of recipes. Opportunities will be provided for demonstrations, writing, and photography with selected business.

- HEFS-637. Special Problems in Food, Nutrition or Food Science** **Credit 3(0-6)**
Independent study/research in the areas of Food, Nutrition or Food Science. Prerequisites: Junior, senior, graduate standing, and consent of instructor.
- HEFS-638. Sensory Evaluation** **Credit 3(2-2)**
A study of the color, flavor, aroma and texture of foods by the use of sensory evaluation methods. Prerequisites: HEFS 236 and 337.
- HEFS-639. Applied Principles for Acting Learning** **Credit 3(2-2)**
The study of basic principles, materials, and evaluation measures underlying active learning experiences in improving children's intellectual style and social relations. Special attention is given to goals and objectives, daily routines, teacher-made materials, questioning techniques and ideas for small and large group activities. Simulated teaching experiences. Prerequisites: HEFS 310, 311, 414, 600.
- HEFS-640. Geriatric Nutrition** **Credit 3(3-0)**
Multi-disciplinary approaches to geriatric foods, nutrition and health problems. Evaluation of nutritional status and nutrition care of the elderly are emphasized. Field experience: nursing home and other community agencies. Prerequisite: HEFS 337 or 439.
- HEFS-641. Current Trends in Food Science** **Credit 3(3-0)**
Recent development in food science and their implications for food scientists, nutritionists, dietitians and other professional in the food industry and related professions.
- HEFS-643. Food Preservation** **Credit 3(2-2)**
A study of current methods of preserving foods - canning, freezing, dehydration, radiation, and fermentation. Prerequisite: HEFS 236 or equivalent.
- HEFS-645. Special Problems in Food Administration** **Credit 2(0-4)**
Individual work on special problems in food administration.
- HEFS-648. Community Nutrition** **Credit 3(3-0)**
Materials, methods, and goals in planning, organizing and conducting nutritional status surveys. Evaluation of food and nutrition programs at state and federal levels. Prerequisites: MATH 224 or SOCI 303; HEFS 337 or equivalent.
- HEFS-650. International Nutrition** **Credit 3(3-0)**
An ecological approach to the hunger and malnutrition in technologically developed and developing countries. Focus on integrated intervention programs, projects, and problems. Opportunities to participate in national and international internships through cooperative arrangements.
- HEFS-655. Observation and Student Teaching in Early Education and Family Studies** **Credit 9(1-16)**
The application and practice of methods, techniques, and materials of instruction in a real classroom situation under supervision. The course includes: teaching purposeful observation, organization of teaching materials, participation in other activities, multi-cultural activities, and parent-teacher association activities. See: University Student Teaching Handbook for specific requirements.
- HEFS-664. Occupational Exploration in Middle Grades** **Credit 3(3-0)**
Designed for persons who teach or plan to teach middle grades occupational exploration in the curriculum, sources and uses of occupational information, approaches to middle grades teaching, and philosophy and concepts of occupational education. This course will be taught in cooperation with the Department of Business Education and Administrative Services, Home Economics and Industrial Education.

HEFS-665. Occupational Exploration in the Middle Grade -**Home Economics****Credit 3(3-0)**

Emphasis is placed on curriculum, methods and techniques of teaching, and resources and facilities for teaching in the service occupations cluster which involves the areas of consumer and homemaking education, personal service, public service, hospitality and recreation, and health occupations.

HEFS-679. Nutrition Education**Credit 3(3-0)**

Philosophy, principles, methods and materials involved in nutrition education. Application of nutrition knowledge and skills in the development of the nutrition education curriculum and programs in schools and communities.

HEFS-680. Computer Assisted Design for Apparel**Credit 3(3-0)**

An introduction to the use of the computer for sketching, pattern making, pattern grading, and making markers. Prerequisites: GCST 133, 233, 234, 430, 631.

DIRECTORY OF FACULTY

Lovie Booker, B.S., University of Arkansas at Pine Bluff; M.S., Tuskegee Institute; Ph.D.; University of North Carolina at Greensboro; Adjunct Professor

Ramona T. Clark, B.A.S.W., M.S.W., California State University; Ph.D., Oklahoma State University; Associate Professor

Thelma Feaster, B.S., North Carolina A&T State University; Ph.D., Ohio State University

Thurman N. Guy, B.S., M.S., North Carolina A&T State University; M.S., University of Wisconsin; Ed.D., University of North Dakota; Associate Professor

Bobby L. Medford, B.A., M.A., Guilford College; Ph.D., The University of North Carolina; Associate Professor

Mendonca, Aubrey F., B.S., M.S., Ph.D., Iowa State University; Research Associate

Rosa Siler Purcell, B.S., North Carolina A&T State University; M.Ed., Ed.D., University of Illinois; Associate Professor and Chairperson

Geraldine Ray, B.S., North Carolina A&T State University; M.Ed., University of North Carolina Greensboro; Ph.D., Virginia Polytechnic Institute and State University

Shirley Rouse, B.S., North Carolina A&T State University; M.Ed., North Carolina State, Ph.D., University of North Carolina at Greensboro

Chung Woon Seo, B.S., M.S., Korea University; Ph.D., Florida State University, Professor

Claudetta Smith, B.S., North Carolina A&T State University; M.S., Ph.D., Ohio State University

Ellen Smoak, B.S., M.S., Ph.D., University of North Carolina at Greensboro

Carolyn S. Turner, B.S., M.S., University of North Carolina at Greensboro; Ph.D., Virginia Polytechnic and State University; Research Associate

Eula King Vereen, R.D.; B.S., Tennessee State University; M.S., The University of North Carolina at Greensboro; Assistant Professor

Wilda Wade, R. D.: B.S., M.S.; North Carolina A&T State University; Ph.D., University of North Carolina at Greensboro; Food and Nutrition Specialist

Jane Walker, B.S., Appalachian State University; M.S., Virginia Polytechnic and State University; Instructor

Department of Natural Resources and Environmental Design

Godfrey Gayle, Chairperson

OBJECTIVES

The objectives of the Department of Natural Resources and Environmental Design are to meet its responsibilities to society by providing training for professional agriculturalists, landscape architects, agricultural engineers and environmentalists who can identify, analyze, and solve the problems of today, as well as new problems that may arise in the future. Realizing the dynamic and ever changing nature of modern society, the Department seeks to minimize prescriptive procedures and provide its students with the tools of analysis and as well as facilities for applying the natural, physical, and social sciences to thinking processes that will enable them to relate to man's present and future needs in managing his environment.

DEGREES OFFERED

Agricultural Technology — B.S. Concentrations:

- A. Soil Science
- B. Agricultural/Industrial Technology
- C. Horticulture Landscape Design

Agricultural Science — B.S. Concentrations:

- A. Soil Science
- B. Plant Science
- C. Horticulture
- D. Earth and Environmental Science

Agricultural Business — B.S. Concentration: Horticulture

Agricultural and Environmental Systems Engineering — B.S.

Landscape Architecture — B.S.

Agricultural Science, Technology — B.S. Concentration: Plant Science

Plant and Soil Science Science — M.S.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs and qualification for the B.S. degree in Natural Resources and Environmental Design are based upon the general admission and graduation requirements of the University.

DEPARTMENTAL REQUIREMENTS

Majors in the Department of Natural Resources and Environmental Design must complete a minimum of 124 semester hours of University courses. Included in the 124 hours are thirty hours in a major elective depending on the option. A minimum grade of "C" or better is required.

PROGRAM IN AGRICULTURAL TECHNOLOGY

The following options are offered in the Department of Natural Resources and Environmental Design leading to the B.S. degree in Agricultural Technology.

- A. Concentration in Soil Science
- B. Concentration in Agricultural/Industrial Technology
- C. Horticulture Landscape Design

CURRICULUM GUIDE FOR THE CONCENTRATION IN SOIL SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
MATH 101	3	MATH 102	3
AGED 101	1	AGED 102	1
PHED 101	1	PHED 102	1
	<u>16</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
BIOL 240	4	BIOL 160	4
SLSC 338	4	ANSC 111	3
NARS 110	3	ANSC 351	3
PHED 200	2	SPCH 250	3
	<u>16</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	3	PHYS 226	3
PHYS 235	1	PHYS 236	1
BIOL 121	4	BIOL 530	4
ECON 301	3	AGEC 330	3
SLSC 517	3	NARS 520	1
Electives (NARS/CROS) ¹	3	SLSC 634	4
	<u>17</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HORT 334	3	EASC 309	3
AGEN 303	3	AGEN 304	3
EASC 627	3	SLSC 421	4
Electives (EASC/SLSC) ²	7	SLSC 633	4
	<u>16</u>	NARS 520	1
			<u>15</u>

Total Credit Hours: 128

¹ 3 hrs. NARS 618, CROS 307, CROS 604.

² 7 hrs. EACS 622, SLSC 609, SLSC 632.

CURRICULUM GUIDE FOR THE CONCENTRATION IN AGRICULTURAL/INDUSTRIAL TECHNOLOGY

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	GEEN 100	2
BIOL 140	4	AGEN 114	3
GEEN 101	2	AGEC 240	2
HIST 100	3	HIST 101	3
	<u>16</u>	PHED Elective	<u>2</u>
			15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 101, 111	4	CHEM 102, 112	4
MATH 113	3	MATH 240	3
ENGL 200	3	ENGL 201	3
MFG 293	3	SPCH 250	2
MFG 472	4	ACCT 221	3
	<u>17</u>	NARS 520	<u>1</u>
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225, 235	4	PHYS 226, 236	4
PSYC 320	3	BUAD 422	3
BUAD 420	3	AGEN 523	3
MFG 491	3	ECON 305	3
AGEN 303	3	AGEN 401	3
	<u>16</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 522	3	MFG 493	3
BUAD 461	3	BUAD 462	3
ECON 301	3	Technical Elective	3
AGEC 330	3	Electives	<u>5</u>
Electives	<u>3</u>		14
	15		

Total Credit Hours: 125

CURRICULUM GUIDE FOR THE CONCENTRATION IN HORTICULTURE LANDSCAPE DESIGN

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST Elective	3	HIST Elective	3
MATH 101	4	MATH 102	4
NARS 110	3	SOCI 100	3
LDAR 101	1	EAS 201	<u>3</u>
LDAR 220	<u>2</u>		16
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL Elective	3	GEOG 200	3
BIOL 100	4	ENGL Elective	3
HORT 202	3	HORT 203	3
HORT 334	3	PHYS 110	2
LDAR 310	<u>3</u>	PHYS 111	1
	16	LDAR 230	3
		SPCH 250	<u>3</u>
			18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SLSC 338	4	AGEN 401	3
CHEM 106	3	LDAR 241	3
CHEM 116	2	BAUD 422	3
LDAR 240	3	BAUD 425	3
Electives	<u>3</u>	ECON 301	3
	15	LDAR 400	<u>3</u>
			18

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 530	4	BIOL 430	4
HORT 610	3	LDAR 420	2
HORT 612	3	Elective	3
PHED Elective	3	HORT 611	3
Elective	<u>2</u>	HORT 613	<u>3</u>
	14		15

Total Credit Hours: 128

PROGRAMS IN AGRICULTURAL SCIENCE

The following options are offered in the Department of Natural Resources and Environmental Design leading to the B.S. degree in Agricultural Science:

- A. Concentration in Soil Science
- B. Concentration in Plant Science
- C. Concentration in Horticulture
- D. Concentration in Earth and Environmental Science

CURRICULUM GUIDE FOR THE CONCENTRATION IN SOIL/PLANT SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
MATH 111	4	MATH 112	4
AGED 101	1	AGED 102	1
PHED 101	1	PHED 102	1
	<u>17</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
BIOL 240	4	BIOL 160	4
SLSC 338	4	ANSC 111	3
NARS 110	3	ANSC 351	3
PHED 200	2	BIOL 121	4
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	3	PHYS 226	3
PHYS 235	1	PHYS 236	1
CHEM 221	3	SLSC 634	4
CHEM 223	2	ECON 301	3
SLSC 517	3	CHEM 222	3
NARS 520	1	CHEM 224	2
Electives (Major Area) ¹	4		<u>16</u>
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 224	3	AGEC 330	3
EASC 622	3	SLSC 421	4
NARS 520	1	SLSC 633	4
EASC 627	3	Electives (Major Area) ³	3
Electives (Major Area) ²	4		14
	14		

Total Credit Hours: 128

¹ 4 hrs. NARS 618, HORT 334, BIOL 530.

² 4 hrs. EASC 309, SLSC 609, SLSC 632.

³ 3 hrs. CROS 307, CROS 604.

CURRICULUM GUIDE FOR THE CONCENTRATION IN HORTICULTURE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST Elective	3	HIST Elective	3
MATH 111	4	MATH 112	4
CHEM 106	4	CHEM 107	3
CHEM 116	2	CHEM 117	2
	15		15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL Elective	3	ENGL Elective	3
BIOL 140	4	BIOL 121	4
NARS 110	3	CHEM 221	3
PHED Elective	2	CHEM 223	2
SLSC 338	4	Electives	3
	16		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	3	PHYS 226	3
PHYS 235	1	PHYS 236	1
ECON 301	3	BIOL 530	4
HORT 334	4	AGEC 330	3
CHEM 222	3	Electives	6
CHEM 224	2		17
	16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
NARS 520	1	BIOL 432	4
BIOL 430	4	Electives (Major Area) ¹	12
Electives (Major Area) ¹	10		16
	15		

Total Credit Hours: 128

¹ Major Electives: HORT 202, 203, 527, 528, 608, 610, 611, LDAR 230, SLSC 421, 517. These courses must be approved by the advisor.

CURRICULUM GUIDE FOR THE CONCENTRATION IN AGRICULTURAL SCIENCE, TECHNOLOGY (PLANT SCIENCE)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
MATH 101	3	MATH 102	3
AGED 101	1	AGED 102	1
PHED 101	1	PHED 102	1
	<hr/> 16		<hr/> 16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
BIOL 140	4	BIOL 160	4
SLSC 338	4	ANSC 111	3
NARS 110	3	ANSC 351	3
PHED 200	2	SPCH 250	3
	<hr/> 16		<hr/> 16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	3	PHYS 226	3
PHYS 235	1	PHYS 236	1
BIOL 121	4	BIOL 530	4
ECON 301	3	AGEC 330	3
SLSC 517	3	NARS 520	1
Elective (NARS/CROS) ¹	3	SLSC 634	4
	<hr/> 17		<hr/> 16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HORT 334	3	EASC 309	3
AGEN 303	3	AGEN 304	3
AESC 627	3	SLSC 421	4
Electives (EASC, SCLC) ²	7	SLSC 633	4
	<hr/> 16	NARS 520	1
			<hr/> 15

Total Credit Hours: 128

¹ 3 hrs. NARS 618, CROS 307, CROS 604.

² 7 hrs. EASC 622, SLSC 609, SLSC 632.

CURRICULUM GUIDE FOR THE CONCENTRATION IN EARTH AND ENVIRONMENTAL SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
MATH 111	4	MATH 112	4
PHED 101	1	PHED 102	1
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
	<u>16</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
EASC 201	3	Electives (Major Area) ¹	4
BIOL 121	4	EASC 309	3
NARS 110	3	MATH 224	3
SPCH 250	3	GEOG 200	3
	<u>16</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 221	3	Electives (Major Area) ¹	3
CHEM 223	2	EASC 433	2
PHYS 225	3	Electives (Major Area) ¹	3
PHYS 235	1	AGEN 410	3
SLSC 338	4	BIOL 621	4
EASC 622	3	EASC 444	1
NARS 520	1		<u>16</u>
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
EASC 616	3	EASC 666	3
Electives (Major Area) ¹	3	EASC 699	3
SLSC 634	4	Electives (Major Area) ¹	3
SLSC 633	4	Electives (Non Major)	5
Electives (Major Area) ¹	3		
	<u>14</u>		<u>17</u>

Total Credit Hours: 128

¹ Major Electives: EASC 408, EASC 624, HIST 210, HIST 322, HIST 307, BUAB 341, ANSC 637, LASC 636, OSH 311, OSH 312, OSH 411, AGED 607, EASC 625, EASC 644, EASC 330, CIEN 310, 311, 618, AGEN 401, SLSC 609, EASC 627, SLSC 632, CHEM 222, CHEM 224, PHYS 101, FORS 618 and approved consortium courses in geology, geography and environmental related courses. These courses must be approved by the advisor.

PROGRAM IN AGRICULTURAL BUSINESS (HORTICULTURE)

This curriculum in the Department of Natural Resources and Environmental Design is mainly designed to serve those majors who are interested in the commercial aspects of Ornamental Horticulture, Nursery Management and Greenhouse Production.

CURRICULUM GUIDE FOR THE CONCENTRATION IN AGRICULTURAL BUSINESS (HORTICULTURE)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
PHED Elective	1	NARS 110	3
AGEN 114	3	PHED Elective	1
	<u>15</u>		<u>15</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL Elective	3	ENGL Elective	3
EASC 201	3	HIST Elective	3
History Elective	3	BIOL 140	4
BIOL 100	4	BIOL 121	4
SPCH 250	3	ECON 300	3
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 240	3	AGEC 330	3
ECON 301	3	BIOL 530	4
HORT 334	3	EASC 309	3
SLSC 388	4	Electives	6
	<u>13</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEC 332	3	BUAD 462	3
BUAD 461	3	AGEC 334	3
NARS 520	1	Electives (Major Area) ¹	12
Electives (Major Area) ¹	10		17
	<u>17</u>		

Total Credit Hours: 126

¹ Major Electives: HORT 202, 203, HORT 527, 528, 608, 610, 611, LDAR 230, SLSC 421, SLSC 517. These courses must be approved by the advisor.

AGRICULTURAL AND ENVIRONMENTAL SYSTEMS ENGINEERING

The program is offered jointly by the School of Agriculture and College of Engineering. See Admission and Matriculation Policies under the College of Engineering.

ACCREDITATION

The undergraduate program in agricultural engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC-ABET).

CURRICULUM GUIDE FOR AGRICULTURAL AND ENVIRONMENTAL SYSTEMS ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	PHYS 241	3
HIST 100	3	PHYS 251	1
ENGL 100	3	ENGL 101	3
GEEN 100	2	CHEM 101	3
GEEN 101	2	CHEM 111	1
PHED Elective	<u>2</u>	GEEN 102	2
	16	MATH 132	<u>4</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 331	3
PHYS 242	3	MEEN 337	3
PHYS 252	1	EASC 309	3
History Elective ²	3	BIOL 221/220	4
MEEN 335	3	AGEN 401	<u>3</u>
Social Science Elective ³	<u>3</u>		16
	17		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 336	3	AGEN 303	3
AGEN 410/CIEN 360	3	ECON 300 or 301	3
ELEN 200	3	MEEN 441	3
ELEN 206	1	AGEN 430	4
CIEN 362	3	ENGL 200	<u>3</u>
CIEN 363	<u>1</u>		16
	14		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEN 304	3	AGEN 523	3
Humanities Elective ²	3	AGEN 624/CIEN 560	3
AGEN 600	3	INEN 260	2
EASC 622 or CIEN 610	3	AGEN 602	3
ECON 305	3	SLSC 632	4
	<u>15</u>	AGEN 520 or GEEN 500	<u>1</u>
			16

Total Credit Hours: 127

¹ 2 hrs. PHED 101, 103, 104, 107, 200, 261, 343.

² 3 hrs. ENGL 201, 202, 203, or an appropriate Black studies course.

³ 3 hrs. PSYC 242, 320, SOCI 306, 314, or an appropriate Black studies course.

PROGRAM IN LANDSCAPE ARCHITECTURE

Landscape Architecture is concerned with quality of land use. It includes analysis of environmental and social factors and recommendations for preservation, design, construction and maintenance of developed land areas. The scope of activities of projects vary from broad, regional landscape planning analysis to detailed site planning.

This curriculum is planned to equip the student to deal with a wide range of environmental problems. A sequence of required courses develops understanding of landscape design theory and practice and construction techniques. Elective and optional course offerings provide the student an opportunity to concentrate in an area of individual interest.

Multiple courses in several major subject areas are sequential. Completing those courses in sequence as listed is required. A student who earns a "D" in a major course may be required to repeat the course.

The following curriculum leads to the Bachelor of Science in Landscape Architecture.

CURRICULUM GUIDE FOR THE CONCENTRATION IN LANDSCAPE ARCHITECTURE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
HIST Elective	3	HIST Elective	3
MATH 101	3	MATH 102	2
SPCH 250	3	LDAR 102	2
LDAR 101	1	AREN 122	3
LDAR 220	2	PHED Elective	<u>1</u>
	<u>15</u>		15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL Elective	3	ENGL Elective	3
GEOG 200	3	SOCI Elective	3
PHYS 110	2	LDAR 203	3
LDAR 202	3	LDAR 230	3
LDAR 240	3	LDAR 241	3
LDAR 310	3	PHED Elective	1
	<u>18</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEOG 210	3	AGEN 401	3
SLSC 338	4	ECON Elective	3
LDAR 330	4	LDAR 341	4
LDAR 340	4	LDAR 400	3
	<u>15</u>	LDAR 331	4
			<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
LDAR 430	3	LDAR 410	4
LDAR 440	4	LDAR 420	2
Electives	9	LDAR 441	4
	<u>16</u>	Electives	6
			<u>16</u>

Total Credit Hours: 128

- Note:** (1) (HIST Elective) will be those from University core requirements in the Social Sciences
 (2) (ENGL Elective) will be those from University core requirements in the Humanities
 (3) (PHED Elective) will be those from University core requirements in Health and Physical Education
 (4) (SOCI Elective) will be selected from SOCI 100, 200, or 300
 (5) (ECON Elective) will be selected from available Economic courses

COURSES WITH DESCRIPTION IN NATURAL RESOURCES AND ENVIRONMENTAL DESIGN

NARS-110. Plant Science I **Credit 3(2-2)**

An introduction to the basic principles underlying the production of economic crops. Brief introduction to drug and medical plants. Prerequisite: BIOL 140.

NARS-300. Plant Science II **Credit 3(2-2)**

History, classification, culture and utilization of economic plants; basic physical, economical and social conditions relating to their growth, distribution, and improvement. Prerequisite: Plant Science 338.

NARS-520. Seminar in Plant Science and Technology **Credit 1(1-0)**
Current problems in Plant Science and Technology. Designed especially for unifying the three major areas of the Department by involving the staff with junior and senior students.

Advanced Undergraduate and Graduate

NARS-618. General Forestry **Credit 3(2-2)**
History, classification, culture, and utilization of native trees, with special emphasis on their importance as a conservation resource, the making of national forestry policy, and the ecological impact of trees on environmental quality. Prerequisite: BIOL 140.

NARS-720. Graduate Seminar in Plant Science **Credit 1(1-0)**
PLSC-777. Special Problems in Plant Science Graduate Studies **Credit 3(3-0)**
PLSC-799. Graduate Thesis **Credit 6(6-0)**

AGRICULTURAL AND ENVIRONMENT SYSTEMS ENGINEERING

AGEN-113. Agricultural Drawing **Credit 3(0-6)**
Lettering, use of instruments, projection drawing, auxiliaries, dimensioning, isometric drawing, working drawings - structural, and graphics (charts and graphs).

AGEN-114. Home and Farm Maintenance **Credit 3(1-4)**
Selection, sharpening, care and correct use of shop tools and equipment; woodworking and simple carpentry; simple electrical repairs; sheet metal work; electric arc and oxyacetylene welding; pipe fitting and simple plumbing repairs.

AGEN-303. Power and Machinery **Credit 3(2-2)**
This course deals with tractive units which include field machinery and tractor power. The first part involves the design principles of field machinery, evaluating the functional performance, and the efficiency of these machines. The second part deals with the thermal analysis of internal combustion engines. Students will learn to measure and calculate tractive and engine powers. Prerequisites: MEEN 336, 337.

AGEN-304. Structures and Environment **Credit 3(1-4)**
This course deals with the fundamentals of building construction applied to location, selection materials, foundations, planning farm structures, and environmental considerations such as temperature, humidity, condensation, and ventilation.

AGEN-401. Surveying, Practices and Principles **Credit 3(2-2)**
An introduction to plane surveying. Topics include: use of surveying instruments, theory of measurements and sources of error, traverse and curve computations, stadia measurements, differential and profile leveling, topographic mapping and design projects.

AGEN-402. Farm Power **Credit 3(1-4)**
Principles of mechanical power, use, care and adjustment of internal combustion engines. Prerequisites: PHYS 241, 251.

AGEN-410. General Hydrology **Credit 3(2-2)**
An introduction to the study of surface and subsurface hydrology. Topics include: hydrologic cycle, rainfall-runoff relationships, precipitation measurements and hydrographs, unit hydrograph analysis, flood routing, planning and design of runoff/detention systems, computer applications in hydrology.

AGEN-430. Agricultural Systems Analysis and Design **Credit 4(2-4)**
System-based thinking will be used to improve the students integrative view in Agricultural Engineering designs. This concept will be used in designing physical models for real world application. Subject matter discussions will include: soft and hard systems, learning styles, defining the problem, relevant systems, design techniques, optimum designs and evaluation. Prerequisites: MEEN 336, GEEN 102, and ECON 300 or 301.

AGEN-520. Senior Seminar **Credit 1(0-3)**
This is a seminar in Agricultural and Environmental Systems Engineering that will provide an opportunity for senior students to make presentations on their research or design projects.

AGEN-522. Dairy/Food Engineering **Credit 3(2-2)**
The general engineering principles of solids, fluids, and process equipment will be discussed. Topics include energy, heat, enthalpy, psychometrics, heat and mass transfer, drying and refrigeration of food products. Prerequisite: MEEN 441, or consent of the instructor.

AGEN-523. Biological and Agricultural Energy Systems **Credit 3(2-2)**
This course discusses the production, utilization, and system design for energy in food and agricultural productions. Specific topics include: biogas, biomass, solar energy, drying, energy analysis, conservation and management, including electric power supply and motor control. Prerequisites: ELEN 200, 206.

AGEN-525. Farm Shop Organization and Management **Credit 3(1-4)**
A course designed for prospective and in-service teachers of vocational agriculture; includes presentation of purpose, plans and equipment of shops, organization of course of study and methods of teaching. Prerequisites: AGEN 114; AGED 501.

Advanced Undergraduate and Graduate

AGEN-600. Soil and Water Engineering I **Credit 3(2-2)**
Improvement of soil and water use by evaluating and using present conservation practices. Water conveying and retaining structures, and soil conservation, drainage and irrigation systems will be discussed and designed. Prerequisites: CIEN 362 and 363, AGEN 410 and 430.

AGEN-601. Advanced Farm Shop **Credit 3(1-4)**
Study of the care, operation, and maintenance of farm shop power equipment. Prerequisite: AGEN 114.

AGEN-602. Agricultural Engineering Design **Credit 3(0-6)**
Special design work in Agricultural Engineering. The major objective is to enhance the design skills of the Agricultural Engineering students. Prerequisite: AGEN 600, AGEN 624 as corequisite.

AGEN-619. Instrumentation and Measurement **Credit 3(2-2)**
This course will emphasize quantitative evaluation of some of the well established parameters such as: temperature, humidity, fluid flow, pressure, displacement, velocity, acceleration, force, stress, strain, etc. that are widely used in the area of Agricultural Engineering. Prerequisites: PHYS 241, MEEN 336.

AGEN-624. Water Resources Engineering **Credit 3(2-2)**
Analysis and design of water resources systems. Topics include: water resources planning, hydraulic structures, introduction to aquifer analysis, well development, pump selection, water quality and management, water laws, and detention and retention pond. Prerequisite: AGEN 410.

AGEN-701. Soil and Water Engineering II**Credit 3(3-0)**

A study of drainage and irrigation designs and their applicability to specific regions and climatic conditions. Discussion of saturated and unsaturated flow and the basic laws that govern flow of water in soils. Open channel flow problems will also be discussed. Prerequisite: AGEN 600.

AGEN-714. Applied Hydrogeology**Credit 3(2-2)**

This course is designed to develop a complete understanding of groundwater - its occurrence, characteristics, development and monitoring. Consequently, the course material will be presented in such a way as to enhance the student's understanding of water quality, aquifer yield and movement in a variety of geologic formations. Topics will also include groundwater contamination and management. Prerequisites: AGEN 410, AGEN 624.

CROP SCIENCE**Undergraduate****CROS-305. Principles of Plant Breeding****Credit 3(2-2)**

An introductory course with emphasis placed on basic principles of plant improvement through genetics; required of all Plant Science majors. Prerequisite: BIOL 140 — General Botany or ANSC 214 — Agricultural Genetics.

CROS-307. Forage Crops**Credit 3(2-2)**

Grasses, legumes and other plants and their uses as hay pasture, silage and special purposes of forages, identification of plants and seeds and study of quality in hay, silage and pasture population. Prerequisite: NARS 110.

CROS-405. Determining Crop Quality**Credit 4(2-4)**

The recognition of high quality crop products as influenced by growth and maturity factors, weeds and diseases, determination of commercial quality through study, land use and grades; identification of crops, planning crop exhibits. Prerequisite: NARS 300.

Advanced Undergraduate and Graduate**CROS-603. Plant Chemicals****Credit 3(2-2)**

A study of the important chemical pesticides and growth regulators used in the production of economic plants. Prerequisites: CHEM 102 and NARS 300.

CROS-604. Crop Ecology**Credit 3(3-0)**

The physical environment and its influence on crops; geographical distribution of crops.

CROS-605. Breeding of Crop Plants**Credit 3(2-2)**

Significance of crop improvements in the maintenance of crop yields; application of genetic principles and techniques used in the improvement of crops; the place of seed certification in the maintenance of varietal purity.

CROS-606. Special Problems in Crops**Credit 3(3-0)**

Designed for students who desire to study special problems in crops. Repeatable for a maximum of six credits. Prerequisite: By consent of instructor.

CROS-607. Research Design and Analysis**Credit 3(2-2)**

Experimental designs, methods and techniques of experimentation, application of experimental design to plant and animal research; interpretation of experimental data. Prerequisites: AGE 644, MATH 224.

CROS-702. Grass Land Ecology**Credit 3(3-0)**

The use of grasses and legumes in a dynamic approach to the theory and practice of grass-land agriculture, dealing with the fundamental ecological principles and their application to management practices.

CROS-750. Advanced Crop Genetics**Credit 3(2-2)**

Reproductive mechanisms in crop plants; genetic basis for the breeding of self-pollinated species and for breeding crosspollinated crops; spontaneous and induced mutations in plants; polyploidy and plant breeding; incompatibility mechanisms in crop plants; requirements for successful breeding for resistance to plant diseases; combining ability and the effects of hybridization in cultivated species; general quality problems in crop plants and variety testing and seed control; preservation of useful germ plasm and the organization of international plant breeding. Prerequisite: Graduate student.

CROS-751. Advanced Plant Cytogenetics**Credit 3(2-2)**

Male sterility and its effects on gene recombination; apomixis and parthenocarpy in crop plants and their effects on variability; cell reproduction and differentiation in tissue culture; gene splicing and crop improvement through genetics; cytological techniques. Prerequisite: Graduate student.

EARTH AND ENVIRONMENTAL SCIENCE**Undergraduate****EASC-201. The Earth—Man's Environment****Credit 3(3-0)**

A study of the earth's system as related to atmosphere, biosphere, hydrosphere and lithosphere. The interrelationship of man with the earth's environment as revealed in the modification of natural processes. No prerequisite.

EASC-309. Elements of Physical Geology**Credit 3(2-2)**

Relation of geological principles in the development of a balanced concept of the earth and earth history; rock and mineral identification, utilization of geological and topography maps, geological processes, resource conservation, urban and environmental problems. Prerequisite: CHEM 101 or consent of instructor.

EASC-330. Elements of Weather and Climate**Credit 3(2-2)**

A study of the fundamental elements of weather conditions as revealed in world patterns of climate types. This course surveys the types of land forms and makes applications to problems in engineering, military science and in planning for agricultural, urban and regional development projects. Prerequisite: EASC 309; SLSC 338, or consent of instructor.

EASC-408. Field Work in Earth Science**Credit 3(1-4)**

Methods of geologic map construction using aerial photographic maps, Brunton Compass, etc., for stratigraphic measurements; interpretation of remotely sensed data.

EASC-433. Fundamentals of Mineralogy**Credit 2(1-2)**

Systematic study of mineral groups, their occurrence, formation, economic importance, identification by xray and other techniques. Prerequisite: EASC 309.

EASC-444. Earth and Environmental Science Seminar**Credit 1(1-0)**

Group discussions, reports, and guest lectures on current environmental issues.

Advanced Undergraduate and Graduate

EASC-616. Environmental Planning and Natural Resources

Management

Credit 3(2-2)

Problems of uncontrolled use of natural resources, increased urbanization, unplanned growth and general deterioration of the manmade and natural environments; basic principles of environmental planning and natural resources management.

EASC-622. Environmental Sanitation and Waste Management

Credit 3(2-2)

Study of traditional and innovative patterns and problems of managing and handling waste products of urban and rural environments, their renovation and reclamation.

EASC-624. Earth Science, Geomorphology

Credit 3(2-2)

Various land forms and their evolution — the naturally evolved surface features of the Earth's crust and the processes responsible for their evaluation, their relation to man's activities and as the foundation for understanding the environment.

EASC-625. Earth Resources

Credit 3(2-2)

Conservation, management and use of renewable and nonrenewable resources. Their impact on the social and economic quality of our environment.

EASC-626. Aquaculture

Credit 3(2-2)

Using water as a natural resource in the production of food for recreation, and wildlife preservation, and its management as it relates to environmental problems affecting water quality with emphasis on freshwater lakes and ponds.

EASC-627. Strategies of Conservation

Credit 3(2-2)

An approach to the teaching of environmental conservation as an integral part of the general curriculum.

EASC-644. Problem Solving in Earth Science

Credit 3(3-0)

Independent field and/or laboratory research in earth and environmental science for advanced students.

EASC-666. Earth System Science

Credit 3(3-0)

Study of the earth as a "system" with emphasis on the atmosphere, biosphere, hydrosphere, and lithosphere interactions as related to global change and human activities.

EASC-699. Environmental Problems

Credit 3(3-0)

Multidisciplinary examination of environmental problems and application of appropriate techniques of analysis to selected problems. Team taught by environmental faculty.

EASC-704. Problem Solving in Earth Science

Credit 3(0-6)

A laboratory-demonstration course involving identification of earth materials, measurements in environmental processes, and field observation of natural physical phenomena.

EASC-705. The Physical Universe

Credit 3(3-0)

This course is designed to give the student a broad general background knowledge of the earth's physical environment; its lithosphere; hydrosphere and atmosphere and their interaction on weather and climate. The physical nature of the star, the sun, and the planets will also be studied in the light of modern concepts of space.

EASC-706. Physical Geology

Credit 3(3-0)

The development of the earth's surface, its material composition and forces acting upon its surface will be considered. Specific topics include origin of mountains and volcanos, causes of earthquakes, work of rivers, wind, waves and glaciers. Prerequisite: EASC 705 or consent of instructor.

EASC-708. Conservation of Natural Resources **Credit 3(3-0)**

A descriptive course dealing with conservation and development of renewable natural resources encompassing soil, water, and air; cropland, grassland, and forests; livestock, fish, and wildlife; and recreational, aesthetic, and scenic values. Attention will be given to protection and development of the nation's renewable natural resources base as an essential part of the national security, defense, and welfare.

EASC-709. Seminar in Earth Science **Credit 2(2-0)**

A seminar concerned with recent developments in the earth sciences and related disciplines.

EASC-718. Applied Environmental Microbiology **Credit 3(2-2)**

Discussion of interactions between microorganisms and their physical environment, and significance of microorganisms in eutrophication, mining spoils, and waste treatments. Prerequisites: BIOL 121 and consent of instructor.

HORTICULTURE

Undergraduate

HORT-118. Amateur Floriculture **Credit 3(2-2)**

General principles of growing flowers on a small scale in small greenhouses, home, school and public buildings; growing flowers outside for landscape effect and cutting. Course designed for nonmajors.

HORT-119. The Functional Usage of Plant Materials **Credit 3(0-6)**

The use of plants and related materials to enhance temporary settings with emphasis on the utilization of horticulture plant materials indoor and out-of-doors. Special attention to be given to temporary gardens, planters, interior scenes and designs. No prerequisite.

HORT-202/LDAR 202. Plant Materials I

Study of plant materials as used in landscape design. Emphasis on major categories of herbaceous plants and woody plants as they pertain to landscape usage. Identification techniques will be introduced and used.

HORT-203/LDAR 203. Plant Materials II

Continuation of LDAR 202 with different plant species.

HORT-334. Plant Propagation **Credit 3(2-2)**

Study of types, construction, and management of propagation structures; fundamental principles of propagation by seed, cuttage, budding, grafting, and layerage. Prerequisite: NARS 110.

HORT-335. Principles of Landscape Design **Credit 3(2-2)**

Fundamentals of design of planning the arrangement of small properties, such as homes, schools, small parks and playgrounds.

HORT-514. Nursery Management **Credit 3(2-2)**

Planning, operations and methods used by wholesale, retail, and landscape nurseries. Emphasis on cultural practices, records and selling techniques. Prerequisite: HORT 334.

HORT-527. Basic Floral Design **Credit 3(1-4)**

Essentials of flower arrangement and plant decoration for the home, office, hospital, school and church. Special attention given to design principles such as balance, scale, harmony, color, and line movement.

HORT-528. Flower Shop Management **Credit 3(2-2)**

Designing, planning, handling of merchandise, buying and selling methods, and general policies. Special attention given to site selection, building style, layout and personnel.

- HORT-529. Landscape Design and Construction I** **Credit 3(0-6)**
Problems in design of land areas with emphasis on orientation, arrangement, and circulation. Instruction in planning, presentation, cost accounting, and construction. Prerequisite: HORT 335.
- HORT-530. Landscape Design and Construction II** **Credit 3(0-6)**
Continuation of HORT 529. Problems in design of larger land areas involving more complex features; practice in landscape model construction. Prerequisite: HORT 529.
- HORT-600. Advanced Plant Propagation** **Credit 4(1-4)**
Advanced principles of plant propagation by plant cell and tissue biotechniques.

Advanced Undergraduate and Graduate

- HORT-608. Special Problems in Horticulture** **Credit 3(3-0)**
Work along special lines given largely by the project method for advanced undergraduate and graduate students who have the necessary preparation. Special arrangement with instructor required.
- HORT-610. Commercial Greenhouse Production I** **Credit 3(2-2)**
Culture of floriculture crops in the greenhouse out-of-doors with emphasis on cut flowers and potted plants. Special attention given to seasonal production as it relates to soils, fertilization and environmental factors.
- HORT-611. Commercial Greenhouse Production II** **Credit 3(2-2)**
Culture of floriculture crops in the greenhouse with emphasis on seasonal production, marketing, insect and disease controls and plant growing structures. Prerequisites: HORT 334 and HORT 610.
- HORT-612. Plant Materials and Landscape Maintenance** **Credit 3(2-2)**
Identification, merits, adaptability, and maintenance of shrubs, trees, and vines used in landscape planting trees, shrubs, bulbs, and perennials.
- HORT-613. Plant Materials and Planning Design** **Credit 3(2-2)**
Continuation of HORT 612 with added emphasis on plant combinations and use of plant as design elements.
- HORT-700. Plant Biotechniques** **Credit 4(1-3)**
Fundamentals of biotechniques in plant cell and tissue culture. Prerequisite: HORT 600.

SOIL SCIENCE **Undergraduate**

- SLSC-338. Fundamentals of Soil Science** **Credit 4(2-4)**
The fundamental nature and properties of soils and introductory treatment of soil genesis, morphology, and classification and land use.
- SLSC-517. Soil Fertility** **Credit 3(3-0)**
General principles of soil fertility; influence of chemical, physical and microbiological properties of soils on crop production. Application of fertility principles in cropping programs. Limited treatment of impact of agricultural pollutants on the environment. Prerequisites: SLSC 338, CHEM 101 or consent of instructor.
- SLSC-518. Soil Fertility Laboratory** **Credit 2(0-4)**
Analytical and diagnostic procedures in studying soil fertility problems. Some treatment of procedures useful for examination of problems resulting from agricultural pollutants. Prerequisites: CHEM 102, SLSC 338 and 517, or consent of instructor.

SLSC-634. Soil Environmental Chemistry **Credit 4(3-2)**

A study of the chemical properties of soil environment including interactions of solid, liquid and gaseous phases. Discussion will also include ion and pollutant interactions with soil, their retention, potential movement and the environmental impact. Additional discussion will include oxidation and reduction, soil acidity and alkalinity and their impact on waste management, resource utilization and the environment.

Advanced Undergraduate and Graduate

SLSC-609. Special Problems in Soils **Credit 3(3-0)**

Research problems in soils for advanced students. Prerequisite: Consent of instructor.

SLSC-632. Soil Physics **Credit 4(2-4)**

A study of fundamental physical principles and laws which govern the behavior of soils. Physical constitution soil water, and soil air. The relationship of soil physical conditions to plant growth and engineering usage. Prerequisites: SLSC 338, CHEM 102, and MATH 113, and consent of instructor. Spring terms of even numbered years.

SLSC-633. Soil Genesis, Classification and Land Use **Credit 4(2-4)**

Factors and processes of soil formation, grouping of soils based on their properties, soil mapping, soil interpretations for various uses and discussion of new concepts in soil taxonomy. Prerequisite: SLSC 338.

SLSC-710. Soils of North Carolina **Credit 3(2-2)**

A study of the factors basic to the understanding of the soils of North Carolina, their classification and properties as related to sound land-use and management.

SLSC-715. Soil Mineralogy **Credit 3(2-2)**

A study of soil minerals with regard to their composition, structure, classification, identification, origin, and significance. Special emphasis on primary weatherable silicates, layer silicates, and oxide minerals. Prerequisites: SLSC 534 and consent of instructor.

SLSC-717. Methodology in Soil, Plant and Water Analysis **Credit 3(0-6)**

A study of principles involved in the analysis of soils, plants, and water. Emphasis on basic chemical and instrumental methods for interpretation of soil fertility and environment. Instruction in the use of special instruments. Prerequisite: SLSC 534.

SLSC-721. Soil Microbiology **Credit 3(2-2)**

Discussion of major groups of organisms, their description, taxonomy, abundance, and their significance and functions. The major role of the microflora in elemental cycle and their presence in terms of agronomic and ecological importance. Prerequisites: SLSC 338 and BIOL 121.

SLSC-727. Soil Fertility and Plant Nutrition **Credit 3(3-0)**

Fundamental and theoretical aspects of soil fertility, productivity and plant nutrients. A discussion of important research data on soil fertility and plant nutrition. Prerequisites: SLSC 517 and consent of instructor.

SLSC-734. Advanced Soil Chemistry **Credit 4(3-2)**

This course is an in-depth discussion of soil chemical interactions in terms of ion exchange, solution equilibria, solubility patterns, and electrochemistry; comprehensive coverage of the chemistry of contaminant interactions with soil, its retention, movement, and the environmental impact, review of relevant advances in soil chemistry in the past and recent times.

LANDSCAPE ARCHITECTURE

LDAR-101. Landscape Architectural Orientation

Credit 1(1-0)

There will be lectures on the field of landscape architecture covering the profession, the discipline and their relationships to allied professions.

LDAR-102. Environmental Design Ethics

Credit 2(2-0)

This course is designed to emphasize issues, values, and ethics in landscape architecture. Current concerns and issues involving the environment, design and social factors will be explored. A variety of ideologies within the practice of landscape architecture and their niches within the profession will be examined.

LDAR-200. Survey of Landscape Architecture

Credit 3(3-0)

Lectures and case studies designed for non-landscape architecture majors that will cover natural resources areas as they relate to the visible landscape, noise, movement, planned communities, urbanization, regional planning and solutions will be explored.

LDAR-202/HORT 202. Plant Materials I

Credit 3(1-4)

This course will concentrate on the study of plant materials as used in landscape design. Emphasis on major categories of herbaceous plants and woody plants as they pertain to landscape usage. Identification techniques will be introduced and used.

LDAR-203/HORT 203. Plant Materials II

Credit 3(1-4)

This course is a continuation of LDAR 202. Different plant species will be the focus of this course. Prerequisite: LDAR 202.

LDAR-220. Visual Communication

Credit 2(0-4)

Students enrolled in this studio course will explore various graphic techniques necessary for communication of ideas. Students will explore landscape architecture presentation styles and formats. Corequisite: LDAR 101.

LDAR-230. Environmental Ecology

Credit 3(3-0)

Basic concepts of ecology, ecosystem structure and function will be explored; energy flow and material recycling emphasized. Field trips are required. Prerequisite: LDAR 220.

LDAR-240. Basic Landscape Design I

Credit 3(0-6)

Students in this studio course will explore basic concept development and principles and elements of design. The course will give students a greater understanding of space through analysis of forms, proportions, and scale. Students will investigate design theory by proposing solutions. Prerequisite: LDAR 220.

LDAR-241. Basic Landscape Design II

Credit 3(0-6)

This studio course is designed to explore further issues of design. Course material will emphasize ideologies about scales, context, and concept development. Projects will explore creative solutions to "real" world constraints (i.e. zoning regulations, economic, environmental, social, political, etc.). The cyclic nature of the design process and its layers will also be emphasized.

LDAR-300. History of African-American Cultural Landscapes

Credit 3(3-0)

This course is to study African and African-American contributions to the cultural landscape of America. Land practices and patterns will be explored.

LDAR-310. History of Landscape Architecture

Credit 3(3-0)

This history course is a study of the development of landscape architecture from antiquity to modern times, with emphasis on its relationships to allied arts and professions. Prerequisite: University History Requirement.

LDAR-330. Landscape Architectural Construction **Credit 4(0-8)**

This studio course will focus on exercises and projects in site engineering. Prerequisites: MATH 102, PHYS 110 and 111. Corequisite: LDAR 340.

LDAR-331. Landscape Architecture Materials and Equipment **Credit 4(0-8)**

This studio course will focus on lectures, exercises and projects dealing with landscape equipment, materials, and techniques. Prerequisites: MATH 102, PHYS 110 and 111. Corequisites: LDAR 341 and 400.

LDAR-340. Intermediate Landscape Architectural Design I **Credit 4(0-8)**

This is a studio course for students to develop design solutions to problems involving private, quasi-public, and public spaces with emphasis on the design process. The student will develop programs, site analysis, concept, and presentation drawings. Prerequisites: AREN 122, LDAR 230, 241, 310. Corequisite: LDAR 330.

LDAR-341. Intermediate Landscape Architectural Design II **Credit 4(0-8)**

This studio course is a continuation of LDAR 340 addressing more complex design issues. Prerequisite: LDAR 340. Corequisites: LDAR 331 and 400.

LDAR-400. Planting Design **Credit 3(0-6)**

This studio course will study the fundamentals of design as applied to aesthetic and functional arrangements. Problems will include preparation of planting plans, cost estimates and technical specifications. Prerequisites: LDAR 202, 203 and 340. Corequisites: LDAR 341 and 331.

LDAR-410. Professional Practice **Credit 4(4-0)**

This course is a study of the professional practice of landscape architecture, including professional ethics and registration laws; the preparation of proposals and contract documents; office administration; job supervision, and relationships with clients and customers. Prerequisites: LDAR 331, 440, 430. Corequisites: LDAR 440, 441.

LDAR-420. Seminar in Landscape Architecture **Credit 2(2-0)**

Individual research, group discussions, and lectures on contemporary issues relating to the practice of landscape architecture are the focus of this seminar. Prerequisite: LDAR 440. Corequisites: LDAR 441 and 410.

LDAR-430. Advanced Landscape Architecture Construction **Credit 3(0-6)**

This studio course will serve as a capstone to landscape architectural construction 330 and 331 with emphasis on understanding and preparing complete sets of construction documents for landscape architecture projects. Prerequisites: LDAR 330 and 331.

LDAR-440. Advanced Landscape Architecture I **Credit 4(0-8)**

This studio course is an in depth group study of a comprehensive landscape architecture management, planning, and design problem; while considering the research, programming, site analysis, conceptual studies, preliminary and master plan, design guidelines, and presentations of recommendations. Prerequisites: LDAR 341, 331, and 400.

LDAR-441. Advanced Landscape Architectural Design II **Credit 4(0-8)**

This studio course focuses on an approved design problem requiring individual work, which will serve as a comprehensive examination. Preparation and presentation are to include a written and graphic problem statement, analysis, and detailed plans, or other activities approved by instructor. Prerequisite: LDAR 440. Corequisites: LDAR 410 and 420.

LDAR-500. Special Problems in Landscape Architecture **Credit 3(3-3)**

This is a course for landscape architecture students to work on independent study projects. Prerequisites: Consent of the instructor and Program Director.

Advanced Undergraduate and Graduate

LDAR-601. Environmental Perception and Design Determinants **Credit 3(3-0)**

Comprehensive perception of natural forces as design determinants. An assessment of systems and methods of perception, classification, analysis and synthesis of natural forces and elements as they affect physical design and human use. Lecture and workshops will emphasize perception and landscape design.

LDAR-602. Qualitative Analysis in Landscape Planning **Credit 3(3-0)**

Evolution and trends of applied physical design in landscape planning. Investigation of actual hypothetical design situations-study of visual and cultural values of landscape resources in planned environments. Lectures and practicums of physical design, site capabilities, landscape structuring, and landscape values.

LDAR-603. Land-Use Planning and Management **Credit 3(3-0)**

A study of human behavioral responses and use patterns within physical environments, with emphasis on special group needs and compatibility with landscape resource areas. Consideration of problems affecting a synthesis of landscape values and design forms, visual and psychological values of planned and unplanned environments and relationships of social functions to landscape architectural forms.

LDAR-604. Factors of Physical Design **Credit 3(3-0)**

A study of human behavioral responses and use patterns within physical environments, with emphasis on special group needs and compatibility with landscape resource areas. Consideration of problems affecting a synthesis of landscape values and design forms, visual and psychological values of planned and unplanned environments and relationships of social functions to landscape architectural forms.

DIRECTORY OF FACULTY

Natural Resources and Environmental Design

McKinley A. DeShield, Jr., B.S. North Carolina A&T State University; M.S., Cornell University; MRE, Duke University; Ph.D., Nottingham University-England; Adjunct Professor

Peggy Fersner, B.S., Virginia Polytechnic Institute; M.S., Clemson University; Lecturer

Godfrey A. Gayle, B.S., North Carolina A&T State University; M.S., Ph.D., N. C. State University at Raleigh, Professor, Coordinator of Agricultural Engineering Program and Chairperson

Marihelen Glass, B.S., Texas Tech. University; M.S., Ph.D., Texas A&M University; Professor, Coordinator of Horticulture Program

Perry Howard, B.L.A., Louisiana State University; M.L.A., Harvard University; Associate Professor and Coordinator of Landscape Architecture Program

Charles A. Panton, B.S., North Carolina A&T State University; M.S., Purdue University; Ph.D., University of Lund, Sweden; Adjunct Associate Professor

Richard Phillips, B.S., Iowa State University, M.S., N.C. State University; P.E. for North Carolina; Adjunct Associate Professor

Charles W. Raczkowski, B.S., M.S., Kansas State University; Ph.D. N.C. State University; Research Associate

G. Bhaskar Reddy, B.S., M.S., A.P.A.U., India; Ph.D., University of Georgia; Professor

M. Raj Reddy, B.S., Osmania University, M.S., A.P., Agricultural University, India; Ph.D., University of Georgia; Professor, Coordinator of Soil/Plant Science Program

Manuel R. Reyes, B.S., M.S., University of the Philippines at Los Banos; M.Phil., Cranfield Institute of Technology, England; Ph.D., Louisiana State University; Assistant Professor
John F. Robinson, Sr., A.A., Jr. College of Albany, B.L.A., Louisiana State University, M.L.A., Harvard University; Professor

Abolghasem Shahbazi, B.S., University of Tabriz; M.S., University of California, Ph.D., Pennsylvania State University; Associate Professor

Godfrey A. Uzochukwu, B.S., M.S., Oklahoma State University; Ph.D., University of Nebraska; Professor and Coordinator of Earth and Environmental Science Program

Sue Ann Ware, B.L.A., Colorado State University; M.L.A. University of California at Berkeley; Assistant Professor

Joan White, B.S., North Eastern University - Boston; M.S., Tufts University; Adjunct Assistant Professor

Robert Williamson, B.S., M.S. Howard University; Ph.D., University of Massachusetts; Agricultural Extension Faculty

COLLEGE OF ARTS AND SCIENCES

A. James Hicks, Dean
Ethel F. Taylor, Assistant Dean

OBJECTIVES

The College of Arts and Sciences introduces the student to many fields of human interests and assists him in acquiring knowledge in the fields of liberal arts and sciences. Its primary aim is to provide a liberal and professional education intended to prepare the student to perform in a wide variety of employment situations. In fulfilling its primary purpose, the College endeavors to provide opportunities for the student to acquire the knowledge, perceptions, values, and skills needed for personal development and social usefulness. It also strives through its formal curriculum and cocurriculum programs to achieve the following objectives:

1. To provide courses in general education for all students.
2. To provide courses of instruction for in breadth and in depth studies in the humanities, natural sciences and mathematics, and the social sciences.
3. To provide an opportunity for the student to acquire the tools or methods with which to gather, analyze, and evaluate information as well as the skills to communicate his thinking to others.
4. To provide the opportunity for individual creativity and development through research and other activities which inspire creativity selfdiscipline, and selfcriticism.
5. To provide an academic base on which individuals may enter graduate areas of specialization.

DEGREES OFFERED

The College of Arts and Sciences is comprised of thirteen departments and programs offering undergraduate majors leading to the Bachelor of Arts or the Bachelor of Science, the Bachelor of Fine Arts, and the Bachelor of Social Work. There is a Master's Program leading to the Master of Arts or the Master of Science in several fields. The Bachelor of Arts degree is offered with major programs of study in Art, Mass Communications, English, French, History, Music, Political Science, Psychology, Sociology, and Speech. The Bachelor of Science degree is offered with major programs of study in Biology, Chemistry, Mathematics, and Physics. The Bachelor of Fine Arts degree is offered in Theatre and the Bachelor of Social Work degree is offered in Social Work. Many degree programs may be pursued jointly with professional education courses offered in the School of Education. Graduates of these programs qualify for certification to teach in the secondary schools. In addition, the Mathematics and Physics Departments have degree programs in association with the School of Engineering in Engineering Mathematics and Engineering Physics.

DEGREE REQUIREMENTS

To attain the baccalaureate degree in the College of Arts and Sciences, a student must satisfactorily complete the requirements of his/her major field, the general education studies and a sufficient number of electives to total 124 credits. The minimum scholastic average required for graduation in any department degree program is a 2.0 average in all major courses in addition to the overall grade point average requirement of 2.0.

ACCREDITATION

All of the programs in the College of Arts and Sciences that have accrediting organizations have been accredited. They are as follows:

- The Department of Chemistry is accredited by the American Chemical Society.
- The Department of Music is accredited by the National Association of Schools of Music. (NASM)
- The undergraduate program in Social Work is approved by the Council on Social Work Education.
- The Bachelor of Fine Arts in Acting program, housed in the Department of Speech Communication and Theatre Arts, is accredited by the National Association of Schools of Theatre. (NAST)
- The Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education and the North Carolina State Department of Public Instruction.

CAREER OPPORTUNITIES

The curricula of the College prepare students for careers in teaching, research, social work, journalism, radio and television, the creative arts, industry and government. Within the professional curricula, students may pursue studies which lead to careers in law, medicine, dentistry, librarianship, teaching and the ministry.

SEMESTER LOAD LIMIT

The normal schedule is 15-16 semester hours per semester. No student may register for more than 18 semester hours per semester without permission of the Dean.

ACADEMIC ADVISEMENT

To assist students in meeting graduation requirements, a system of student advisement is provided in all departments. Academic advising is essential for assuring the student that the programs of study he/she is pursuing include the requirements of his/her particular department and desired degree. It assists also in helping students make maximum use of the learning opportunities in the University and in helping them with academic problems.

ADMISSION REQUIREMENTS

Admission requirements for the College of Arts and Sciences are the same as those for the University. Requirements for graduation vary from department to department, so students must be certain to satisfy departmental requirements. Students are responsible for meeting all academic requirements for graduation.

GENERAL EDUCATION PROGRAM REQUIREMENTS

The purposes of the general education program of the College of Arts and Sciences are to prepare students to enter the specialized part of their university education, and to provide essential elements of a higher education not necessarily included in students' specialties. Accordingly, the general education curriculum of the College of Arts and Sciences is designed to:

1. Insure that students acquire basic skills in communication (reading, writing, speaking, and listening) and mathematics;

2. Develop in students a capacity for sustained analysis that is critical, reasoned, informed, and independent, and acquaint students with the ethical, political, and cultural issue concerning which value judgments must be made and responsibilities assumed;
3. Acquaint students with the use of the scientific method in both the natural and the social sciences and provide students with facts, concepts, and theories concerning the natural and social environments;
4. Impart to students the ideas, values, and events that make up their cultural tradition, familiarize them with the comparable experiences of other cultures, and deepen students' sensitivities through experiencing works of the imagination;
5. Create in students a positive attitude towards their fields of endeavor and improve in them those skills which will be useful for further study and competency in their areas of specialization;
6. Acquaint students with good health practices and creative uses of leisure time and strengthen the students' self-images to enable them to deal constructively with changes in a technological and computerized world while maintaining high moral standards and aesthetic values.

To achieve the above purposes, the College has developed a set of general requirements from which the student must choose sixteen courses in five fields. The general education requirements are listed below:

- I. English Composition (2 courses required)
- II. Science (Natural and Physical) and Mathematics (2 courses required)
 - Chemistry, Botany, Zoology, and Physics, (2 courses required)
 - Mathematics
- III. Foreign Languages (2 courses required)
 - Spanish, French, German
- IV. Science (Social & Behavioral) (4 courses required)
 - Anthropology, Economics, Geography, History, Political Science, and Sociology
- V. Humanities (4 courses required)
 - Art, English, Humanities, Music, Philosophy, and Speech

Certain courses require specific prerequisites; therefore, each student should select courses with this fact in mind.

Certain majors require specific courses, so each student must be knowledgeable about departmental requirements in selecting these courses.

Students planning to enter teaching fields should be knowledgeable of the semester hour requirements.

Students should be aware also that satisfactory advanced placement scores and/or comparable experiential evidence may be used to satisfy some of the requirements for a baccalaureate degree. Students should consult the chairperson of their respective department(s) for information.

COLLEGE HONORS PROGRAM

The Honors Program in the College of Arts and Sciences is a plan for exceptionally promising and talented students. Honors students take honors courses in the general studies and major fields. Those whose major departments offer honors curricula have opportunities to intensify and increase in-depth knowledge of their major field and its relationship to other fields. Honors students can further enhance their studies through honors seminars, independent

research and other special activities. Entering freshmen who are recommended by their high school principal and counselor and who have SAT scores ranging from 800 and above will be eligible to apply. All students who participate must complete an application form and have an overall GPA of at least 3.0 and a departmental GPA of 3.0.

Each Honors Program student will have a committee composed of at least one (1) faculty member from his major department along with the Honors Program Coordinator to assist him in planning his Honors curriculum. During the last semester before graduation the student's honors committee will review the performance of all participating students who have successfully completed 12 hours of Honors Program work with a minimum grade of "C" in each course to determine if the student should be recommended for graduation from the Honors Program. Students who successfully complete the Honors Program will receive citations as "Honors Program Graduate" on their transcripts and diplomas and will be given special recognition at Commencement.

Interested students should contact the office of the Dean of the College of Arts and Sciences for application information. The formal application must be received at least six (6) weeks prior to the beginning of the semester for which enrollment in the Honors Program is desired.

Department of Art

Timothy O. Hicks, Chairperson

OBJECTIVES

The objectives of the Art Department are simple and direct: to guide the students through carefully planned classroom, studio, and working experiences, to develop their aesthetic sensibilities, technical ability and to broaden their general education. This basic preparation lays a foundation for further study, careers as creative artists and art teachers.

DEGREES OFFERED

Art Design — B.A.

Art Painting — B.A.

Art Education — B.S. * Art Education, Secondary—M.S.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the Department of Art is based upon general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Art Major — The major in art must complete 124 semester hours of University courses. Included in the 124 semester hours are 40/58 hours of art in courses at the 200 level or above. A minimum grade of "C" must be achieved in these courses.

In the advance studio courses, students may expect to purchase certain materials which are not supplied by the Art Department. These materials may cost from \$5.00 to \$45.00 depending on the courses taken by the student.

* See Graduate Bulletin for details.

CURRICULUM GUIDE FOR THE MAJOR IN DESIGN ART

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 100	3	ART 101	3
ART 224	2	ART 225	2
Elective (PSYC)	3	Elective (PSYC)	3
PHED 200	2	ENGL 101	3
ENGL 100	3	MATH 102	3
MATH 101	3		<u>14</u>
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 226	3	ART 222	3
Elective (PSYC)	3	ART 227	3
BIOL 100	4	ART 229	3
Electives	2	Elective (Humanities)	3
Elective (Humanities)	3	PHED 100	3
Elective (Humanities)	3	PHED 110	3
	<u>18</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 400	2	ART 228	3
ART 401	3	ART 402	3
ART 459	2	FOLA (FREN/GERM)	3
Elective (PSYC)	3	Elective (Humanities)	3
Elective	3	TECH 233	1
FOLA (FREN/GERM)	3	TECH 233 (LAB)	2
	<u>16</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 520	2	ART 525	3
ART 524	3	ART 526	3
ART 405	3	ART 456	3
ART 406	3	Electives	6
ART 455	3		<u>15</u>
	14		

Total Credit Hours: 124

Painting Option

The same as Design Option except Art 528 and 529 are substituted for Art 455 and 456.

CURRICULUM GUIDE FOR THE MAJOR IN TEACHING ART

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 100	3	ART 101	3
CUIN 100	1	Elective	3
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
MATH 101	3	MATH 102	3
Elective (PHED)	1	PHED 200	<u>2</u>
Elective	<u>2</u>		17
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 224	2	ART 225	2
ART 226	3	ART 227	3
CUIN 300	2	CUIN 301	2
FOLA (FREN/GERM)	3	FOLA (FREN/GERM)	3
ENGL 200	3	ENGL 201	3
PSYC 320	3	Elective	<u>2</u>
PHED (Elective)	<u>1</u>		15
	17		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 400	2	ART 229	3
ART 405	3	ART 401	3
CHEM 100	1	BIOL 100	4
CHEM 110	3	CUIN 400	3
ART 600	3	SPCH 250	<u>3</u>
Elective	<u>3</u>		16
	15		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ART 454	3	CUIN 500	3
ART 459	2	CUIN 525	3
ART 520	2	CUIN 560	6
ART 524	3	CUIN 624	<u>3</u>
CUIN 436	<u>3</u>		15
	13		

Total Credit Hours: 124

Teaching Major in Art — The teaching major in art must complete a minimum of 124 semester hours of University courses. Included in these 124 hours are thirty semester hours of art courses at the 200 level or above with grades of "C" or better.

CAREER OPPORTUNITIES

The programs offered by the Department of Art prepare students for such careers as commercial artists, draftsmen, illustrators, freelance artists, directors and supervisors of art agencies, art teachers, and art supervisors.

SECOND MAJOR REQUIREMENT

Art Education majors in accordance with State Department of Public Instruction Guidelines relative to the "Second Major Requirement" should take at least nine hours from the following group of courses. ART 228—Color Theory—3 Hrs.; ART 406—Printing Techniques—3 Hrs.; ART 525—Lithography and Serigraphy—3 Hrs.; ART 526—Senior Project—3 Hrs.; and ART 529—Painting II—3 Hrs.

DIRECTORY OF FACULTY

Yuheng Bao, B.A., Beijing Teachers College, M.A., The Academy of Arts of China; Ph.D., Ohio University; Assistant Professor

James E. McCoy, B.S., North Carolina College; M.A., Columbia University; Assistant Professor

Stephanie A. Santmyers, B.F.A., Alfred University, M.S., Illinois State University; M.F.A., University of North Carolina at Greensboro; Associate Professor

Henry E. Sumpter, B.S., North Carolina Agricultural & Technical State University, M.F.A., University of North Carolina at Greensboro; Assistant Professor

LeAnder Canady, B.A., North Carolina Agricultural & Technical State University; M.F.A., University of North Carolina at Greensboro; Assistant Professor

COURSES WITH DESCRIPTION FOR ART Undergraduate

ART- 100. Basic Drawing and Composition (Formerly Art 3200) Credit 3(0-6)

A study of the fundamental principles of drawing as a mode of visual expression. Selected problems involving basic consideration of line, form, space and composition are presented for analysis and laboratory practice.

ART-101. Lettering and Poster Design (Formerly Art 3201) Credit 3(0-6)

A comprehensive study of the art of letting. Projects involving the principles of layout, poster construction, and general advertising.

ART-220. Graphic Presentation I (Formerly Art 3220) Credit 2(0-4)

Exercises in various sketching techniques and media, including work with pencil, charcoal, crayon, and ink. Individual instruction is given using forms in nature and still life for art and architectural presentation. Prerequisite: Sophomore classification.

ART-221. Graphic Presentation II (Formerly Art 3221) Credit 2(0-4)

The theory of color mixture. Individual instruction in the techniques of watercolor painting for architectural presentation. Studies from nature and still life. Prerequisite: Art 220.

ART-222. Watercolor (Formerly Art 3222) Credit 3(0-6)

Experimental exploration of all aqueous media: watercolor, casein, gouache; their possibilities and limitations.

ART-224. Art Appreciation (Formerly Art 3224) Credit 2(2-0)

An introduction to the study of art. Basic qualities of various forms of artistic expression are explained. Emphasis is placed on the application of art principles in every day life.

ART-225. An Introduction to the History of Art (Formerly Art 3225) Credit 2(2-0)

A general introduction to the history of art, beginning with an examination of ancient art in terms of their extant monuments and culminating with the analysis and comparison of representative works of today.

ART-226. Design I (Formerly Art 3226) Credit 3(0-6)

An introduction to visual design based upon an analysis of the aims, elements, principles, sources of design and their application in a variety of media.

ART-227. Design II Credit 3(0-6)

A continuation of Art 226 with consideration given to three dimensional as well as two dimensional problems. Students are encouraged in the experimental use of materials and are required to find individual and complete solutions to problems through various stages of research, planning, and presentation. Emphasis is placed on technical perfection and the development of professional attitudes.

ART-228. Color Theory (Formerly Art 3228) Credit 3(0-6)

Problems directed toward understanding of color through creative experiment and application of color in visual organization. Use of slides, filmstrips, and trips.

ART-229. Anatomy and Figure Drawing (Formerly Art 3229) Credit 3(0-6)

A study of the human figure with emphasis on anatomy, body structure and proportions, draped figures at rest and in action. Special emphasis is given to detailed studies, composition, and stylization.

ART-400. Renaissance Art (Formerly Art 3240) Credit 2(2-0)

The study of the Renaissance in Italy and in major regions of northern and western Europe from 1300 to 1600.

ART-401. Ceramics (Formerly Art 3241) Credit 3(0-6)

Introduction to sculptural form with the use of clay modeling, basic plaster techniques, wood, and metal in relation to the production of sculpture. Sculpting, decorating, glazing, and firing. Supplementary reading is required.

ART-402. Basic Sculpture (Formerly Art 3242) Credit 3(0-6)

Introduction to sculptural form with the use of clay modeling, basic plaster techniques, wood, and metal in relation to the production of sculpture.

ART-403. Jewelry and Metalwork (Formerly Art 3243) Credit 3(0-6)

The design and technical essentials of Jewelry making and metalwork. Prerequisites: Art 226, 227.

ART-405. Materials and Techniques (Formerly Art 3245) Credit 3(0-6)

A study of the materials of the artist; supports, ground, vehicles, binders, and protective covering. Exploration of the possibilities of various techniques of picture construction as a point of departure for individual expression.

ART-406. Painting Techniques (Formerly Art 3246) Credit 3(0-6)

A continuation of Art 405 with further work in projects that explore the esthetic opportunities and problems implicit in the use of varying media. Work in tempura, gouache, casein, polymers, and lacquers.

ART-450. Advertising Design I (Formerly Art 3250) Credit 3(0-6)

The study of basic tools of advertising design. Students are introduced to lettering techniques, layout problems, and reproduction processes for advertising, illustrations, posters, and television.

- ART-451. Advertising Design II (Formerly Art 3251)** **Credit 3(0-6)**
Preparation and rendering of art work for reproduction from rough idea layouts to finished illustration. Creative and technical class work is augmented by visits to commercial studios and printing companies. Prerequisite: Art 450.
- ART-452. Commercial Art (Formerly Art 3252)** **Credit 3(0-6)**
Illustration techniques. Different materials and renderings employed in advertising illustration such as airbrush colored inks, scratch board, etc. Attention is given to techniques of printing is as far as they affect graphic design.
- ART-453. Typography (Formerly Art 3253)** **Credit 3(0-6)**
The study of typography in relation to lettering advertising, and design. Prerequisites: Art 101 and 450.
- ART-454. General Crafts (Formerly Art 3254)** **Credit 3(0-6)**
Introduction to craft processes; weaving, metalwork, leather, etc.
- ART-455. Fabric Design and Basic Weaving (Formerly Art 3255)** **Credit 3(0-6)**
Basic principles of design as related to textiles and other flat surface decoration. The warping, threading, and weaving on small looms, History of fabric design and weaving. Prerequisites: Art 226, 227.
- ART-466. Fabric Painting and Weaving** **Credit 3(0-6)**
The emphasis is on printing techniques and designers' tools to achieve effective results and on the use of the large looms for creating interesting fabrics. Study of contemporary trends in weaving. Prerequisites: Art 226, 227, 455.
- ART-457. Stage Design and Marionette Production I** **Credit 3(0-6)**
(Formerly Art 3257)
Problems in scene design and stage setting with experiments in stage lighting. Attention is given to the designing and construction of marionettes for simple plays. Field trips and attendance at plays are required.
- ART-458. Stage Design and Marionette Production II** **Credit 3(0-6)**
A continuation of ART 457.
- ART-459. Baroque and Rococo Art (Formerly Art 3259)** **Credit 2(2-0)**
The study of art in Europe from 1600 to 1800.
- ART-520. Modern Art (Formerly Art 3260)** **Credit 2(2-0)**
European and American Art from about 1875 to the present.
- ART-524. Introduction to Graphic Arts (Formerly Art 3264)** **Credit 3(0-6)**
Introduction to printmaking processes. Production of prints in varied media: linoleum, woodcuts, drypoint etchings, serigraphs, and lithographs.
- ART-525. Lithography and Serigraphy (Formerly Art 3265)** **Credit 3(0-6)**
Exploration of the techniques of lithography and serigraphy as a means of contemporary artistic expression. Emphasis of medium determined by individual interest.
- ART-526. Senior Project (Formerly Art 3266)** **Credit 3(0-6)**
Students who have given evidence of their ability to do serious individual work on a professional level may plan and carry out a project of their own choosing, subject to approval and supervision of a faculty member.
- ART-528. Painting I (Formerly Art 3268)** **Credit 3(0-6)**
Creative painting in various media with emphasis on a modern approach and handling of medium. Research and experience in contemporary trends: abstracts, non-objective, and abstract expressionism.

ART-529. Painting II (Formerly Art 3269) Credit 3(0-6)

Development of the student as a professional artist; advance research and familiarization with contemporary trends, concepts, forms, and symbols. Emphasis on an original contemporary statement.

Advanced Undergraduate and Graduate

ART-600. Public School Art (Formerly Art 3270) Credit 3(3-0)

Study of materials, methods, and procedures in teaching art in public schools. Special emphasis is placed on selection and organization of materials, seasonal projects, lesson plan.

ART-602. Seminar in Art History (Formerly Art 3273) Credit 3(3-0)

Investigation in depth of the background influences which condition stylistic changes in art forms by analyzing and interpreting works of representative personalities.

ART-603. Studio Techniques (Formerly Art 3273) Credit 3(3-0)

Demonstrations that illustrate and emphasize the technical potentials of varied media. These techniques are analyzed and discussed as a point of departure for individual expression.

ART-604. Ceramic Workshop (Formerly Art 3274) Credit 2(0-2)

Advanced studio problems and projects in ceramics with emphasis on independent creative work. The student is given opportunity for original research and is encouraged to work toward the development of a personal style in the perfection of technique.

ART-605. Printmaking (Formerly Art 3275) Credit 3(3-0)

Investigation of traditional and experimental methods in printmaking. Advanced studio problems in woodcut etching, lithography, and serigraphy.

ART-606. Sculpture (Formerly Art 3276) Credit 3(3-0)

Further study of sculpture with an expansion of techniques. Individual problems for advanced students.

ART-607. Project Seminar (Formerly Art 3277) Credit 2(0-4)

Advanced specialized studies in creative painting, design, and sculpture. By means of discussion and suggestions this seminar intends to solve various problems which might arise in each work. Prerequisite: Consent of the instructor.

ART-608. Arts and Crafts (Formerly Art 3278) Credit 3(3-0)

Creative experimentation with a variety of materials tools and processes: projects in wood, metal, jewelry making wood and metal construction, fabric design, leather craft, puppet making, and paper sculpture.

Department of Biology

Joseph J. Whittaker, Chairperson

PROGRAM OBJECTIVES

The objectives of the Biology Department are:

- To prepare professional biologists for global participation in the nature of scientific investigations and the scientific enterprise for the betterment of society;
- To prepare biology majors for graduate studies in biological or life science-based studies;
- To prepare students to meet basic admission requirements of graduate and professional schools (i.e. medical, dental and veterinary science);
- To prepare students to teach biology at the secondary school level;

- To provide the opportunity for an academic background in the life sciences as a part of the general education for the student population at the University;
- To provide cognate courses for students majoring in or receiving certification in other fields, including but not limited to; agricultural sciences, home economics, nursing, horticulture, and physical education;
- To avail the resources of the department (human and infrastructural) with the local and academic community through cooperative programs, workshops, seminars, course offerings, etc.

DEGREES OFFERED

Biology — B.S., M.S.

*Biology, Secondary Education — B.S., M.S.

The curricula of the two undergraduate programs listed above are similarly structured in the freshman and sophomore years. The course requirements of the upper level of these programs vary in that each is geared toward its specific goal. Departmental advisors assist all biology students in recommending both major and non-major electives and in academic advisement for both the professional and secondary education sequences.

Curriculum requirements at the graduate level include selected courses in cell and molecular biology, organismal, population biology, and biochemistry. Students desiring a graduate degree in education also follow prescribed education course requirements.

*See the Bulletin of the Graduate School.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the degree programs in the Department of Biology is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Biology Major — Biology majors are required to complete a minimum of 126 hours for graduation. In the “preprofessional sequence”, the student is required to complete a minimum of 46 semester hours of biology and 42 semester hours of supporting courses. The remaining courses satisfy the University’s general education requirements. Students may also be expected to complete a one semester practicum in the department.

Teaching Major in Biology — Majors following the “teacher education sequence” are required to complete a minimum of 128 semester hours of University courses. Included in these 128 hours are a minimum of 35 semester hours of biology and 64 semester hours of supporting courses. The remaining courses satisfy the University’s *general* education requirements. A student may also be expected to complete a one semester practicum in the department.

ENRICHMENT PROGRAMS

Several enrichment programs are available to students in the department which are designed to increase the knowledge and competitiveness of biology majors. They include:

- *Departmental Seminars* (including the Artis P. Graves Lecture Series and the MARC Honors Colloquium). Researchers from industry, medical institutions, research laboratories and universities deliver talks on current findings and interact with students regarding various life science topics. Open to all students.

- *Health Careers Academic Advancement Program (HCAAP) and Health Careers Opportunity Program (HCOP)*. HCAAP is in association with the N.C. Health Manpower Development Program at the University of North Carolina-Chapel Hill and HCOP is administered through East Carolina School of Medicine. Both HCAAP and HCOP are academic skills improvement programs for persons interested in health fields. Sophomores through seniors may apply. Consult the health careers advisor.
- Selected students may gain research experience through participation in the Minority Biomedical Research Support Program (MBRS), the *Minority Access to Research Careers Program (MARC)*, the *Partnership for Excellence in the Natural Sciences Program (PENS)*, and other funded faculty research.
- *Student Clubs*. Biology majors are strongly encouraged to participate in the Biology Club and/or the Health Careers Club. Both are open to all interested University students. Consult the respective Club advisors.

ACCREDITATION/FEDERAL SUPPORT

All Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education (via the National Science Teachers Association) and approved by the North Carolina State Department of Public Instruction. As is the standard in quality programs nationally, the department receives training and research support from Federal, State and private funding agencies.

ENRICHMENT FACILITY

- *Herbarium (NCATG)*. A collection of approximately 6,000 specimens, several dozen of which were collected in the 1800's. NCATG is registered internationally.
- *Reading Room*. An enrichment area containing references, color slide tapes, video cassette materials, microcomputers and software, and other self-instructional materials.
- *Atrium/Museum*. Valuable small mammal, bird and other collections are exhibited in the core of the building.

RESEARCH

- Biotechnology
- Cell & Molecular Biology
- Endocrinology/Biochemistry
- Developmental Biology
- Electron Microscopy
- Bacteriology/Biochemistry
- Virology/Immunology
- Parasitology/Medical Entomology
- Environmental Biology/Ecology
- Experimental Plant Taxonomy/Floristics
- Plant Physiology
- and Others

CAREER OPPORTUNITIES

Due to the depth of required courses in biology and the breadth of support courses in the quantitative sciences, languages, humanities, the arts and others, Biology majors qualify for employment in many fields. Satisfying careers await successful graduates in industry, government and education. Highly motivated graduates in biology frequently compete successfully for entry into professional (medicine, dentistry, pharmacy, allied and public health, etc.), and graduate schools. Jobs in technical and pharmaceutical sales, museum curation, hospital administration, environmental law, and teacher education are merely a sample of career opportunities available to graduates in biology.

CURRICULUM GUIDE FOR THE MAJOR IN BIOLOGY

Preprofessional Sequence

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 101	4	BIOL 160	4
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
ENGL 100	3	ENGL 101	3
MATH 131 ¹	4	MATH 132	4
PHED 101 ²	1	PHED 102 ²	1
	<u>17</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 201	4	BIOL 221	4
BIOL 240	4	BIOL 260	4
CHEM 221	3	CHEM 222	3
CHEM 223	2	CHEM 224	2
MATH 231	4	ENGL 260 or ENGL 331	3
	<u>17</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 310	3	BIOL 466	3
BIOL 462	4	FOLA 101, 103 or 1053	3
FOLA 100, 102, or 1043	3	PHYS 242	4
PHYS 241	4	PHYS 252	1
PHYS 251	1	Elective - Free	3
	<u>15</u>	SPCH 250	3
			<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 561	4	BIOL 569	1
BIOL 468	1	BIOL Elective	3
BIOL Elective	3	Elective - Free	3
Elective (Humanities) ⁴	3	Elective (Humanities) ⁴	3
Elective (Social Science) ⁵	3	Elective (Social Science) ⁵	3
	<u>14</u>		<u>13</u>

Total Credit Hours: 126

* *Effective Fall Semester, 1994.*

¹ *Students not eligible to enter MATH 131 must complete MATH 110 prior to enrolling in MATH 131.*

² *Substitute courses are accepted for PHED 101 and PHED 102 upon approval of major advisor.*

³ *Two consecutive courses in the same foreign language.*

⁴ *Courses which may be taken as Humanities electives: ENGL 200, 201, 433, 650, 652, 654, 656, 658, 660; FOLA 417 or 618; MUSI 220 or 221; THEA 630.*

⁵ *Courses which may be taken as Social Science electives: HIST 100, 101, 215, 216, 310, 311, 328, 412, 416, 615 or 616; POLI 220 or 445; SOCI 314; SPCH 302; ECON 615; CUIN 627.*

CURRICULUM GUIDE FOR THE MAJOR IN BIOLOGY - SECONDARY EDUCATION* Teacher Education Sequence

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 101	4	BIOL 240	4
CHEM 106	3	CHEM 107	3
CHEM 116	2	CHEM 117	2
ENGL 100	3	ENGL 101	3
MATH 1311	4	MATH 132	4
PHED 1012	1		<u>16</u>
	<u>17</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 260	4	BIOL 221	4
CHEM 221	3	Elective - Free	3
CHEM 223	2	CHEM 222	3
CUIN 300	2	CHEM 224	2
Elective (Social Science) ⁵	3	CUIN 301	2
PHED 200	2	Elective (Social Science) ⁵	3
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 462	4	BIOL 466	3
Elective (Humanities) ⁴	3	Elective (Humanities) ⁴	3
FOLA 100, 102 or 104 ³	3	FOLA 101, 103, or 105 ³	3
PHYS 225	3	PHYS 226	3
PHYS 235	1	PHYS 236	1
SPCH 250	3	PSYC 320	3
	<u>17</u>		<u>16</u>

	Senior Year		
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 310	3	CUIN 500	3
BIOL 561	4	CUIN 535	3
BIOL 468	1	CUIN 560	6
CUIN 400	3		12
CUIN 436	3		
CUIN 624	3		
	<hr/> 17		

Total Credit Hours: 128

* Effective Fall Semester, 1994.

¹ Students not eligible to enter MATH 131 must complete MATH 110 prior to enrolling in MATH 131.

² Substitute courses are accepted for PHED 101 and PHED 102 upon approval of major advisor.

³ Two consecutive courses in the same foreign language.

⁴ Courses which may be taken as Humanities electives: ENGL 200, 201, 433, 650, 652, 654, 656, 658, 660; FOLA 417 or 618; MUSI 220 or 221; THEA 630.

⁵ Courses which may be taken as Social Science electives: HIST 100, 101, 215, 216, 310, 311, 328, 412, 416, 615 or 616; POLI 220 or 445; SOCI 314; SPCH 302; ECON 615; CUIN 627.

COURSES WITH DESCRIPTION FOR BIOLOGY Undergraduate

BIOL-100. Biological Science¹ **Credit 4(3-2)**

This is a general education course that stresses the objectives presented under the general education program of the University. This course stresses central concepts in biology including; basic chemical and physical phenomena, biochemistry, cell form and function, genetics, evolution, and multicellular organization. The laboratory will examine major biological concepts. Biological Science is not open to Biology majors. Prerequisite: none.

BIOL-101. Concepts of Biology **Credit 4(3-2)**

This course is an introduction to science and the scientific method, basic biochemistry, cell structure and function, energy and metabolism, reproduction and genetics, evolution, life's diversity, and basic ecological principles for those students planning to enroll in additional major courses in the biological sciences. The laboratory will emphasize central biological concepts. Prerequisite: Credit or concurrent enrollment in CHEM 106 & 116.

BIOL-160. General Zoology **Credit 4(3-2)**

This is an introductory study of structure, physiology and phylogeny of the major animal phyla. The laboratory emphasizes the comparative anatomy and taxonomy of the animals. Prerequisite: BIOL 101.

BIOL-201. Molecular Biology **Credit 4(2-4)**

This course examines the molecular events in cell function using molecular genetics, cell biology, and fundamental biochemistry; using both prokaryotic and eukaryotic systems. The laboratory will emphasize fundamental techniques used in molecular biology. Prerequisite: BIOL 101; CHEM 107.

BIOL-220. Basic Microbiology (Formerly Biol. 120) **Credit 4(2-4)**

This is an introduction to the fundamentals of microbiology and the role of microorganisms in daily life. Special emphasis is placed on infectious diseases and immunology. The laboratory introduces students to the principles of microscopy, specimen preparation for light microscopy, aseptic techniques, cultivation techniques, and the biochemical activities of microorganisms. This course is not open to majors in Biology and Chemistry. Prerequisite: BIOL 100 or 101; CHEM 104 or its equivalent.

BIOL-221. General Microbiology (Formerly Biol. 121) **Credit 4(2-4)**

This is an introduction to the basic principles of microbiology. Microbial ultrastructure, growth, metabolism, molecular genetics, diversity, infectious diseases, and immunology will be discussed. The laboratory introduces students to the principles of microscopy, specimen preparation for light microscopy, aseptic techniques, cultivation techniques, and the biochemical activities of microorganisms. Prerequisites: BIOL 101; CHEM 107 & 117.

BIOL-240. General Botany (Formerly Biol. 140) **Credit 4(2-4)**

Plants as living organisms constitute an integral part of man's environment. Emphasis is placed on the relationship between plant structure and function, the diversity of organisms traditionally classified as plants, and plant physiology. The laboratory will emphasize plant structure and functions. Prerequisite: BIOL 101.

BIOL-260. Comparative Evolution of the Vertebrates **Credit 4(2-4)**

This course is a comparative study of chordate organ systems with rather detailed emphasis on the evolution and organogenesis of primitive chordates, dogfish shark and the cat. The laboratory emphasizes the comparative anatomy of representative chordates. Prerequisite: BIOL 101.

BIOL-310. Ecology **Credit 3(3-0)**

This course surveys the major principles underlying the interactions between living organisms and their environment. Both plant and animal examples will be used to illustrate the basic ecological processes. Emphasis is placed on the characterization of different physical environments; ecosystem processes such as ecological energetics and nutrient cycling; and current organismal concepts of adaptation, niche, population dynamics, life-history phenomena, organismal interactions and community organization. Major environmental issues concerning humans and their cultures will also be presented. Prerequisites: BIOL 101; CHEM 107 & 117.

BIOL-361. Human Anatomy and Physiology (Formerly Biol. 461) **Credit 4(2-4)**

This course is a study of the general structure and function of the human body. It is not open to Biology majors. The laboratory emphasizes human anatomy and major physiological processes. Prerequisites: BIOL 100; CHEM 104 or its equivalent.

BIOL-369. Human Anatomy (Formerly Biol. 469) **Credit 3(2-2)**

This course is a general introduction to human anatomy. The laboratory emphasizes the fundamental structure of the human body. This course is not open to Biology majors. Prerequisites: BIOL 100; CHEM 104 or its equivalent.

BIOL-370. Human Physiology (Formerly Biol. 560) **Credit 3(2-3)**

An introductory course with emphasis placed on basic principles and mechanisms of physiological functioning of body cells, tissues and systems. Required of majors in Physical Education. Not open to Biology majors. Prerequisite: BIOL 369.

BIOL-400. Field Biology **Credit 3(2-2)**

This course emphasizes how ecological knowledge is acquired and communicated. Fundamental techniques of sampling, numerical analysis, and the measurement of environmental factors will be studied using local aquatic and terrestrial communities. The laboratory emphasizes the study of local biomes. Prerequisite: BIOL 310.

BIOL-430. Plant Taxonomy **Credit 4(2-4)**

The fundamentals of taxonomy, botanical nomenclature and modern systematics are covered. An introduction to selected families and genera of vascular plants is included. The laboratory provides exposure to the common elements of the local flora and instruction in herbarium techniques. Prerequisite: BIOL 240.

BIOL-432. Plant Physiology**Credit 4(2-4)**

This course is designed to develop a clear understanding of the basic physiological processes related to the structure, growth, and function of seed plants. The laboratory will emphasize major concepts in plant physiology. Prerequisites: BIOL 240, CHEM 107.

BIOL-460. Invertebrate Zoology**Credit 4(2-4)**

A comprehensive study of the morphology, function, phylogeny, classification and the life histories of representative forms of lower and higher invertebrate groups exclusive of insects. The laboratory emphasizes the functional morphology of the invertebrates. Prerequisite: BIOL 160.

BIOL-461. Sociobiology (Formerly Biol. 261)**Credit 3(3-0)**

This course stresses the biological basis of social behavior and the organization of animal societies. Prerequisite: BIOL 310.

BIOL-462. Introductory Cell Physiology (Formerly Biol. 562)**Credit 4(2-4)**

This course is a treatment at the molecular level of the fundamental processes of living cells. The biochemistry of cellular constituents, bioenergetics, intermediary metabolism, and the regulatory mechanisms of the cell will be discussed. The laboratory will include exercises on the measurement of hydrogen ion activity, physical and chemical properties of macromolecules and membranes, chromatography, enzymes and enzyme kinetics, cell fractionation studies, and the use of spectrophotometry in the identification and characterization of cellular macromolecules. Prerequisites: BIOL 201; CHEM 222.

BIOL-465. Histology**Credit 4(2-4)**

This course is a study of the microscopic anatomy of cells, tissues, and organs with special emphasis on normal histological structure and function. The laboratory emphasizes the major tissues. Prerequisite: BIOL 160.

BIOL-466. Principles of Genetics**Credit 3(2-2)**

This course is a study of the traditional, classical areas of genetics as well as an introduction to gene action at the molecular level, including DNA and RNA structure, function and interactions in cellular systems. The laboratory features exercises with *Drosophila*. Prerequisite: BIOL 201.

BIOL-467. General Entomology**Credit 3(2-2)**

This course emphasizes the structure, description, and habits of the principal orders of insects. Laboratory work will consist of collecting, mounting, preserving, and classification of principal insect representatives. Recommended for general science and biological science majors. Prerequisite: BIOL 160.

BIOL-468. Biology, Technology, and Ethics I (Formerly Biol. 568)**Credit 1(0-2)**

This course evaluates recent technological advances in biology and how these advances impact societal issues and create ethical concerns. The course uses a seminar format. It is required for all undergraduate biology majors. Prerequisite: Senior standing.

BIOL-530. Plant Pathology**Credit 4(2-4)**

This course is an introduction to the organisms and environmental conditions that cause disease in plants, the disease cycle, the effects of diseases on host plants, the nature of plant resistance, and strategies for controlling plant disease. A survey of major pathogens and plant diseases with an emphasis on important agricultural and horticultural plants is included. The laboratory emphasizes the identification of plant pathogens. Prerequisite: BIOL 240.

BIOL-561. Developmental Biology**Credit 4(2-4)**

This course is an introduction to the cellular and molecular aspects of development in animal and plant systems. Laboratory exercises provide an introduction to techniques in classi-

cal experimental embryology and modern developmental biology. Prerequisites: BIOL 201, 260. BIOL 462 is recommended.

BIOL-569. Biology, Technology, and Ethics II

Credit 1(0-2)

This seminar course is concerned with ethical issues in biology. It is required for all preprofessional Biology majors. Prerequisite: BIOL 468.

Advanced Undergraduate and Graduate

BIOL-610. Prokaryotic Biology

Credit 4(2-4)

This course is a survey of the taxonomy, classification, ultrastructure, reproduction, physiology, and ecology of selected bacteria and bacteriophages. The laboratory will emphasize self-instruction and independent study. Prerequisites: BIOL 220 or 221, BIOL 466.

BIOL-620. Food Microbiology (Formerly Biol. 420)

Credit 4(2-4)

This is a survey of selected topics in food microbiology. The course will cover the metabolic pathways, organisms and processes involved with food production from fermented dairy products, vegetables, fruits and meats. Food spoilage, preservation, infection, and intoxication will also be discussed. The laboratory will introduce students to the microorganisms involved with food production and spoilage. Prerequisite: BIOL 220 or 221.

BIOL-621. Soil Bacteriology (Formerly Biol. 421)

Credit 4(2-4)

This is a study of the major groups of soil organisms including their classification and relation to soil environments. The abundance, significance, and functions of soil microorganisms as well as their role in chemical cycles in soil will be discussed. The laboratory will emphasize methods for studying soil microbes. Prerequisite: BIOL 220 or 221.

BIOL-630. Molecular Genetics

Credit 3(3-0)

This course will examine DNA and RNA structure, function, and processing in prokaryotic and eukaryotic systems. Various aspects of recombinant DNA technology will be examined. Prerequisites: BIOL 201, 466.

BIOL-631. Endocrine Physiology

Credit 3(3-0)

The course will provide a basic introduction to endocrine function and include recent advances in the field of endocrinology. Emphasis will be placed on general aspects of endocrine physiology, the organization of the endocrine system, mechanisms of hormone action, and control of endocrine secretion. Prerequisites: BIOL 201, 462.

BIOL-642. Special Problems in Biology

Credit 3(2-2)

This course offers laboratory research projects on specific problems in biology for advanced students. The lecture portion of the course will emphasize central concepts in the research area. Prerequisites: BIOL 462, or 466 or permission of instructor and advisor.

BIOL-661. Mammalian Biology

Credit 3(3-0)

This course is a study of the evolutionary history, classification, adaptation and variation of representative mammals. Prerequisites: BIOL 160, 260.

BIOL-663. Experimental Developmental Biology (Formerly Biol. 666)

Credit 3(1-4)

This lecture-laboratory course is designed to provide students with better understanding and appreciation of experimentation and experimental results in the area of developmental biology. Laboratory projects are experimental studies aimed at encouraging the reading and understanding of research papers in the literature. Prerequisites: BIOL 561 or Graduate Standing.

BIOL-664. Microscopic Technique

Credit 3(1-4)

A laboratory course designed to develop skills to prepare cells, tissues, and organs of microscopic observation and study. Lecture will emphasize central concepts in microscopy. Prerequisites: BIOL 201, 462. BIOL 465 is recommended.

BIOL-665. Evolution**Credit 3(3-0)**

This course will emphasize the genetics of populations and sources of genetic variation; causes of genetic change in populations including natural selection; speciation; and the evolutionary history of life on earth. Prerequisites: BIOL 310 and 466.

BIOL-667. Animal Physiology (Formerly 571)**Credit 3(3-0)**

This course will provide students with an understanding of the current state of animal physiology at the level of the whole organism and its component organs and organ systems. Emphasis will be placed on function as it relates to survival of organisms in natural environments and on the regulation of homeostatic mechanisms. Topics would include metabolism, temperature, regulation, reproductive mechanisms, circulation, gaseous exchange, nutrient processing, osmoregulation and ionic balance. Prerequisites: BIOL 160, 462.

BIOL-668. Animal Behavior**Credit 3(3-0)**

This course is a study of the qualitative and quantitative difference between behavioral characteristics at different evolutionary levels, adaptiveness of differences in behavior and the development of behavior will be emphasized. Prerequisites: BIOL 311, 466.

BIOL-669. Recent Advances in Cell Biology**Credit 3(3-0)**

This course is designed to meet the needs of advanced undergraduate and graduate students desirous of the more recent trends concerning functions of organized cellular and subcellular systems. Current research as it relates to the molecular and fine structure basis of cell function, replication, and differentiation will be discussed. Prerequisites: BIOL 462, 466, and concurrent enrollment or credit in CHEM 224.

BIOL-671. Principles and Practices of Immunology**Credit 3(3-0)**

This course is a study of mammalian immune responses; particularly in humans. Special emphasis will be placed on the physiology, genetics, and regulation of immune responses. Interrelationships between nonspecific and specific immune reactions, humoral and cell-mediated immunity, effector cells, and diseases are also stressed along with research and diagnostic methodologies. Prerequisites: BIOL 221, 466; CHEM 221, 222.

BIOL-680. Animal Physiological Ecology**Credit 3(3-0)**

This course is an introduction to the physiological adaptations of individuals that enable them to make the internal adjustments necessary to grow and reproduce in changing environments. This course will emphasize the physiological strategies for nutrient acquisition, gaseous exchange, water and ion balance, and thermal tolerance. Prerequisites: BIOL 310, 462.

¹ General Education course for non-majors.

DIRECTORY OF FACULTY

David W. Aldridge, B.S., M.S., University of Texas-Arlington; Ph.D., Syracuse University; Postdoctoral, Woods Hole Marine Biological Laboratories; Associate Professor

Jerry Bennett, B.S., Tougaloo College; M.S., Atlanta University; Ph.D., Iowa State University; Associate Professor

Roy Coomans, B.S., Eckerd College; Ph.D., University of North Carolina-Chapel Hill; Assistant Professor

Doretha B. Foushee, B.S., Shaw University; M.S., North Carolina Central University; Ph.D., University of Maryland at College Park, Associate Professor

Andrew G. Goliszek, B.S., University of West Florida; M.S., Ph.D., Utah State University; Postdoctoral, Wake Forest University; Assistant Professor

A. James Hicks, B.S., Tougaloo College, Ph.D., University of Illinois Urbana; Postdoctoral, Missouri Botanical Gardens-St. Louis Extramural Associate, N.I.H.Bethesda; Professor and Dean of the College of Arts and Sciences

Alfred Hill, Jr., B.S., Prairie View College, M.S., Colorado State University; Ph.D., Kansas State University; Professor

Thomas L. Jordan, B.A., Rockhurst College; M.S., Ph.D., University of Wisconsin, Madison, Post Doctoral, University of Washington, Seattle, Associate Professor

Perry V. Mack, B.S., South Carolina State College; M.S., North Carolina Central University, Ed.D., Rutgers University, Extramural Associate, N.I.H.-Bethesda; Professor

Bette L. McKnight, B.A., Barber-Scotia College; M.T., Watts Hospital School of Medical Technology; M.A., North Carolina Central University; Ph.D., Meharry Medical College; Postdoctoral-, University California at Berkeley. Assistant Professor

William H. Mitchell, B.S., West Virginia State College, M.A., Purdue University M.S., University of North Carolina-Greensboro; Assistant Professor

Mary A. Smith, B.S., Morgan State University; M.S., Ph.D., Cornell University, Post-Doctoral, Plant Research Lab-Michigan State University, Associate Professor

Joseph J. White, B.S., M.S., North Carolina College-Durham; Ph.D., University of Illinois-Urbana; Professor

Joseph J. Whittaker, A.B., Talladega College; Ph.D., Meharry Medical College; Postdoctorals, Purdue University and Washington University; Associate Professor and Chairperson

James A. Williams A.B., Talladega College, M.S., Atlanta University; Ph.D., Brown University; Professor

Department of Chemistry

Alex N. Williamson, Chairperson

OBJECTIVES

The objectives of the Chemistry Department are:

1. To prepare chemistry majors for graduate study in chemistry or other chemistry-based sciences;
2. To prepare majors for admittance to medical, dental, and other professional schools;
3. To prepare majors for careers as professional chemists;
4. To prepare majors to teach chemistry at the secondary school level;
5. To provide majors in other departments with a functional understanding of chemistry commensurate with the needs of their chosen field;
6. To provide all students served by the department with an insight into the nature of scientific investigations and the scientific enterprise in general;
7. To offer for graduate students learning experiences and research leading to a M.S. Degree in Chemistry;
8. To offer learning experiences and research leading to a M.S. Degree in education with a concentration in Chemistry;
9. To share the resources (human and physical) of the department with the local and academic community through cooperative programs, workshops, seminars, course offerings, etc.;

10. To contribute to the extension of basic knowledge in Chemistry and related sciences through applied and basic research, educational experimentation, publications, etc.

DEGREES OFFERED

Chemistry—B.S., M.S.*

Chemistry, Secondary Education—B.S., M.S.*

*See Bulletin of the Graduate School

GENERAL PROGRAM REQUIREMENTS

Chemistry Major—the professional major in chemistry must complete 125 semester hours of University courses. The student may select one of two options in order to complete the professional major. The options are: The American Chemical Society (ACS) Certified Program or the Pre-Health Program. The ACS program requires that the student complete 44 semester hours in basic chemistry courses and six to eight hours in advanced chemistry courses. The Pre-Health Program requires the student to complete 44 semester hours in basic chemistry courses and 16 semester hours of basic biology courses. A minimum grade of "C" must be achieved in all basic chemistry courses.

Teaching Major in Chemistry—The teaching major in chemistry must complete a minimum of 132 semester hours of University courses. Included in these 132 hours are 41 semester hours of basic chemistry courses. A minimum grade of "C" must be achieved in all basic chemistry courses.

Bachelor of Science/Master of Science in Chemistry—This curricula is identical in the first two years to the professional major's program leading to the Bachelor of Science degree. It is designed to enable talented undergraduate students to obtain the B.S. and M.S. degrees, in Chemistry, during a five year period of study and research. Any rising junior in chemistry with a gradepoint average of 3.0 in Chemistry and 2.7 overall average is eligible.

ACCREDITATION

The professional curriculum (ACS Certified Program) is accredited by the American Chemical Society. All Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education and approved by the North Carolina State Department of Public Instruction.

CAREER OPPORTUNITIES

B.S. level graduates in chemistry qualify for employment in many fields. There are many career opportunities for chemists in education, government, and industry.

In industry, the chemistry graduate with a B.S. degree may be employed in manufacturing-plant management, research and development, product development, technical sales, marketing, etc. B.S. level chemists work in research at federal, state, municipal, and university laboratories.

The B.S. degree program prepares students to pursue graduate study in chemistry or other chemistry-based sciences (biochemistry, pharmacology, physiology, chemical physics, material science, etc.), medicine, dentistry, and other health professional areas.

CURRICULUM GUIDE FOR THE PROFESSIONAL MAJORS IN CHEMISTRY

A. Professional Curriculum (ACS Certified)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 106	3	CHEM 107	3
CHEM 108	1	CHEM 117	1
CHEM 116	1	ENGL 101	3
ENGL 100	3	HIST 101	3
HIST 100	3	MATH 131	4
MATH 110	4	PHED ¹	<u>1</u>
PHED ¹	<u>1</u>		15
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 221	3	CHEM 222	3
CHEM 223	2	CHEM 231	3
MATH 132	4	CHEM 232	2
PHYS 241	3	PHYS 242	3
PHYS 251	2	PHYS 252	2
GERM 102 or FOLA 106	<u>3</u>	GERM 103 or FOLA 107	<u>3</u>
	17		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 441	3	CHEM 442	3
CHEM 224	2	CHEM 443	1
MATH 231	4	CHEM 511	3
ENGL 200	3	ENGL 201	3
BIOL 160	<u>4</u>	BIOL 140 ²	4
	16	CHEM 610	<u>2</u>
			16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 431	3	Electives (Advanced Chem.) ³	3-4
CHEM 432	2	Electives	<u>9</u>
CHEM 444	1		12-14
CHEM 545	3		
Electives (Advanced Chem.) ³	3-4		
Elective	<u>3</u>		
	15-16		

Total Credit Hours: 123-126

¹ PHED 200 may be substituted for the two courses in Physical Education.

² A biology course for which BIOL 160 is a prerequisite may be substituted for BIOL 140.

³ To be selected from CHEM 611, 621, 631, 641, 643, 651, and 503 or 504.

B. Professional Curriculum (Pre-Health)

The Program is the same during the first two years as that of the ACS Certified Curriculum.

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 441	3	CHEM 442	3
CHEM 224	2	CHEM 443	1
BIOL 160	4	CHEM 511	3
ENGL 200	3	BIOL 260	4
Elective	<u>3</u>	ENGL 201	3
	15	CHEM 610	<u>2</u>
			16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 431	3	PSYC 562	4
CHEM 432	2	Electives	<u>9</u>
CHEM 444	1		13
CHEM 545	3		
BIOL 561	4		
Elective	<u>3</u>		
	16		

Total Credit Hours: 124

C. Curriculum Guide for the Major in Teaching Chemistry

The program is the same during the first two years as that of the professional curriculum except Personal Hygiene (PHED. 200) is required.

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 441	3	CHEM 443	1
CHEM 224	2	CHEM 511	3
MATH 231	4	BIOL 140 ²	4
BIOL 160	4	CUIN 301	2
CUIN 300	2	SPCH 250	3
ENGL 200	<u>3</u>	ENGL 201	<u>3</u>
	18		16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEM 431	3	CUIN 500	3
CHEM 432	2	CUIN 535	3
CUIN 400	3	CUIN 560	6
CUIN 436	3		<hr/> 12
PSYC 320	3		
EASC 309	3		
	<hr/> 17		

Total Credit Hours: 127

²A biology course for which BIOL 160 is a prerequisite may be substituted for BIOL 140.

B.S./M.S. Curricula

Additional required Chemistry Courses beyond the B.S.-level are CHEM 611, 701, 702, 722, 732, 743 or 749, 799, and 5 hours from among 600 and 700 level Chemistry courses.

COURSES WITH DESCRIPTION IN CHEMISTRY

CHEM-099. Introductory Chemistry **Credit 3(3-0)**

Basic methods and concepts in chemistry with emphasis on solving chemistry problems. Recommended first course in chemistry for students having little or no background in high school chemistry. May be used as preparation for CHEM 101, 104, or 106.

CHEM-100. Physical Science * (Formerly Phy. Sc. 1601) **Credit 3(3-0)**

A one semester introductory course designed to make clear the nature of science as an enterprise and illustrate by numerous examples how science really proceeds. Learning experiences are constructed so that they closely approximate real life situations where one has to search for clues and insights from a variety of sources. This course is not open to students who have received credit for CHEM 101, 102, 104, 105, 106, or 107.

CHEM-101. General Chemistry I * (Formerly Chem. 1611) **Credit 3(3-0)**

Introduction to the study of chemistry, atomic structure and periodicity, chemical bonding, states of matter and phase transitions, solutions, and electrolytes. This course is designed for majors in engineering and other sciences. Chemistry majors may register for this course with departmental approval. Prerequisites: 2 units of high school algebra or equivalent and 1 unit of high school chemistry or CHEM 099.

CHEM-102. General Chemistry II * (Formerly Chem. 1612) **Credit 3(3-0)**

A continuation of general chemistry including an introduction to qualitative inorganic analysis. Prerequisite: CHEM 101.

CHEM-104. General Chemistry IV * (Formerly Chem. 1615) **Credit 3(3-0)**

Introduction to fundamental techniques and concepts in chemistry, including writing and interpretation of symbols, formulas, equations, atomic structure, composition and reactions of inorganic compounds. This course is not open to majors in chemistry, physics, biology, mathematics and engineering.

CHEM-105. General Chemistry V * (Formerly Chem. 1616) **Credit 3(3-0)**

A study of organic chemistry and the chemical changes which take place during life processes. Prerequisite: CHEM 104 or equivalent.

CHEM-106. General Chemistry VI * (Formerly Chem. 1618) Credit 3(3-0)

A course which emphasizes basic principles and important theoretical concepts of chemistry. Topics will include atomic structure, electronic configuration, the wave mechanical model of the atom, chemical bonding, states of matter, chemical equilibria, systems of acids and bases, and electrochemistry. Prerequisites: 2 units of high school algebra or equivalent and 1 unit of high school chemistry or CHEM 099.

CHEM-107. General Chemistry VII * (Formerly Chem. 1619) Credit 3(3-0)

A continuation of CHEM 106. Includes chemistry of important metals and nonmetals and a rigorous treatment of qualitative inorganic analysis.

CHEM-108. Chemistry Orientation (Formerly Chem. 1617) Credit 1(1-0)

A series of lectures and discussions on the nature and requirements of the chemical profession; the application of chemistry to modern living, and other selected topics.

CHEM-110. Physical Science Laboratory Credit 1(0-2)

A laboratory course designed to bring students into working contact with the essential aspects of scientific experiences. It is in this course that the student develops concrete ideas about the operational meaning of the scientific method and problem solving. Corequisite: CHEM 100. This course is not open to students who have received credit for CHEM 111, 112, 114, 115, 116, or 117.

CHEM-111. General Chemistry Laboratory * Credit 1(0-3)

An introduction to quantitative studies of substances and chemical reactions. Emphasis is also placed on the development of manipulative skills. Corequisite: CHEM 101.

CHEM-112. General Chemistry II Laboratory * Credit 1(0-3)

Continuation of CHEM 111 with an introduction to qualitative analysis. Corequisite: Chemistry 102. Prerequisite: CHEM 111.

CHEM-114. General Chemistry IV Laboratory * Credit 1(0-3)

A study of inorganic reaction and substances and their relation to the processes. Corequisite: CHEM 104.

CHEM-115. General Chemistry V Laboratory * Credit 1(0-3)

A study of organic reactions and substances and their relation to life processes. Corequisite: CHEM 105. Prerequisite: CHEM 114.

CHEM-116. General Chemistry VI Laboratory * Credit 1(0-3)

A course which emphasizes quantitative studies of chemical reactions such as acid-base studies, redox reactions, and equilibrium reactions. Emphasis is also placed on the development of manipulative skills in the laboratory. Corequisite: CHEM 106.

CHEM-117. General Chemistry VII Laboratory * Credit 1(0-3)

A continuation of CHEM 116 with an introduction to qualitative analysis. Corequisite: CHEM 107. Prerequisite: CHEM 116.

CHEM-210. Cooperative Experience I Credit 2(2-0)

A supervised learning experience in a specified private or governmental chemical facility. The student's performance will be evaluated by reports from the supervisor of the experience and the departmental staff. The student must present a seminar regarding the experience upon return to the University.

CHEM-221. Organic Chemistry I * Credit 3(3-0)

A study of the hydrocarbons (aliphatic and aromatic) and introduction to their derivatives. Prerequisites: CHEM 102, 105, or 107.

- CHEM-222. Organic Chemistry II* (Formerly Chem. 1622)** **Credit 3(3-0)**
Continuation of the study of derivatives of hydrocarbons and more complex compounds. Prerequisite: CHEM 221.
- CHEM-223. Organic Chemistry I Laboratory*** **Credit 2(0-4)**
This laboratory course emphasizes the study of physical and chemical properties of aliphatic and aromatic compounds. Modern instrumentation such as gas and column chromatography, infrared and ultraviolet analyses are used. Corequisite: CHEM 221.
- CHEM-224. Organic Chemistry II Laboratory*** **Credit 2(0-6)**
A continuation of Chemistry CHEM. However, more emphasis is placed on syntheses and qualitative analysis of organic compounds. Corequisite: CHEM 222.
- CHEM-231. Quantitative Analysis I (Formerly Chem. 331)** **Credit 3(3-0)**
Titrimetric and gravimetric analyses including theory and calculations associated with acid-base equilibria, oxidation reduction, nucleation, and precipitation-complexation processes. Corequisite: MATH 131. Prerequisite: CHEM 102 or 107.
- CHEM-232. Quantitative Analysis I Laboratory*** **Credit 2(0-4)**
This laboratory course emphasizes the basic principles of chemical separations. Laboratory studies of gravimetric and titrimetric analyses are also encountered. Corequisite: CHEM 231. Prerequisite: CHEM 117.
- CHEM-251. Elementary Biochemistry (Formerly Chem. 1624)** **Credit 2(2-0)**
A study of fundamental cellular constituents. Emphasis is placed on physiological applications and analyses. Prerequisites: CHEM 105 or 221. This course is open to nonchemistry majors only.
- CHEM-252. Elementary Biochemistry Laboratory*** **Credit 1(0-3)**
Elementary biochemical reactions are studied with emphasis placed on applications to biology, home economics and nursing. Prerequisite: CHEM 115 or 223. Corequisite: CHEM 251.
- CHEM-301. Current Trends in Chemistry (Formerly Chem. 1641)** **Credit 2(2-0)**
A series of lectures and discussions on special problems in chemistry and of the chemical profession not covered in formal courses.
- CHEM-310. Cooperative Experience II** **Credit 3(3-0)**
A supervised learning experience in a specified private or governmental chemical facility. The student's performance will be evaluated by reports from the supervisor of the experience and the departmental staff. The student must present a seminar regarding the experience upon return to the University.
- CHEM-431. Quantitative Analysis II (Formerly Chem. 1662)** **Credit 3(3-0)**
A study of the theory and the operational features of some of the more important instruments that are currently being used as analytical tools such as ultraviolet, visible-light, and infrared spectrophotometers, electro-analytical instruments, thermo-metric titrators, fluorimeters, etc. Prerequisite: CHEM 441. Corequisite: CHEM 442, 444.
- CHEM-432. Quantitative Analysis II Lab** **Credit 2(0-4)**
This laboratory course features the utilization of modern instruments such as ultraviolet, visible and infrared, and atomic absorption spectrophotometers, chromatographs (gas-liquid and liquid), electroanalyzer, and electrophoretic analyzer. Corequisite: CHEM 431.
- CHEM-441. Physical Chemistry I (Formerly Chem. 1663)** **Credit 3(3-0)**
A study of the fundamental laws governing matter in the gaseous state, and the laws of thermodynamics and their applications to chemistry; includes an introduction to statistical thermodynamics. Prerequisites: MATH 132, PHYS 241 and CHEM 231.

- CHEM-442. Physical Chemistry II (Formerly Chem. 1664)** **Credit 3(3-0)**
A continuation of CHEM 441. Studies of solid and liquid states, solutions, phase equilibria, chemical kinetics, and electrochemistry. Prerequisite: CHEM 441.
- CHEM-443. Physical Chemistry I Laboratory*** **Credit 1(0-3)**
Thermodynamic and kinetic studies are emphasized in this course. Corequisite: CHEM 441.
- CHEM-444. Physical Chemistry II Laboratory*** **Credit 1(0-3)**
A continuation of CHEM 443. Corequisite: CHEM 442.
- CHEM-503. Chemical Research (Formerly Chem. 403)** **Credit 4(0-10)**
Makes use of the laboratory and library facilities in studying minor problems of research. Prerequisites: Advanced standing and permission of the Department.
- CHEM-504. Independent Study (Formerly Chem. 404)** **Credit 4(0-10)**
Independent study or research in a particular area of chemistry. Prerequisites: Permission of the department and advanced standing.
- CHEM-511. Inorganic Chemistry** **Credit 3(3-0)**
Introductory survey of structure and bonding in inorganic compounds; coordination compounds of the transition metals; donor-acceptor interactions; bonding theories. Prerequisite: CHEM 441. Corequisite: CHEM 442.
- CHEM-545. Physical Chemistry III (Formerly 502)** **Credit 3(3-0)**
A study of quantum chemistry and its application to studies of atomic and molecular structure. Prerequisite: CHEM 442.

Advanced Undergraduate and Graduate

- CHEM-610. Inorganic Synthesis (Formerly Chem. 1670)** **Credit 2(1-3)**
Discussion of theoretical principles of synthesis and development of physical-analytical techniques in the synthesis of inorganic substances. Prerequisites: One year of physical chemistry.
- CHEM-611. Advanced Inorganic Chemistry (Formerly Chem. 1671)** **Credit 3(3-0)**
A course in the theoretical approach to the systematization of inorganic chemistry. Prerequisite: CHEM 442.
- CHEM-621. Intermediate Organic Chemistry (Formerly Chem. 501)** **Credit 3(3-0)**
An in depth examination of various organic mechanisms, reactions, structures, and kinetics. Prerequisites: CHEM 222 and CHEM 442.
- CHEM-624. Qualitative Organic Chemistry (Formerly 1776)** **Credit 5(3-6)**
A course in the systematic identification of organic compounds. Prerequisite: One year of Organic Chemistry.
- CHEM-631. Electroanalytical Chemistry (Formerly Chem. 1781)** **Credit 3(3-0)**
A study of the theory and practice of polarography, chronopotentiometry, potential sweep chronoamperometry and electrodeposition. The theory of diffusion and electrode kinetics will also be discussed along with the factors which influence rate processes, the double layer, adsorption and catalytic reactions. Prerequisite: CHEM 431 or equivalent.
- CHEM-641. Radiochemistry (Formerly Chem. 1782)** **Credit 3(3-0)**
A study of the fundamental concepts, processes, and applications of nuclear chemistry, including natural and artificial radioactivity, sources, and chemistry of the radioelements. open to advanced majors and others with sufficient background in chemistry and physics. Prerequisite: CHEM 442 or PHYS 406.

CHEM-642. Radioisotope Techniques and Applications**(Formerly Chem. 1783)****Credit 2(1-3)**

The techniques of measuring and handling radioisotopes and their use in chemistry, biology, and other fields. Open to majors and non-majors. Prerequisite: CHEM 102 or 105 or 107.

CHEM-643. Introduction to Quantum Mechanics**(Formerly Chem. 1784)****Credit 3(3-0)**

Non-relativistic wave mechanics and its application to simple systems by means of the operator formulation. Prerequisites: CHEM 442 and PHYS 222. Corequisite: MATH 231.

CHEM-651. General Biochemistry (Formerly Chem. 1780)**Credit 5(3-0)**

A study of modern biochemistry. The course emphasizes chemical kinetics and energetics associated with biological reactions and includes a study of carbohydrates, lipids, proteins, vitamins, nucleic acids, hormones, photosynthesis, and respiration. Prerequisites: CHEM 431 and 442.

DIRECTORY OF FACULTY

William K. Adeniyi, B.S., Hampton Institute M.S., Loyola University (Chicago); Ph.D., Baylor University; Assistant Professor

Foluso Adebodun, B.S., Jersey City State College; M.S., Rutgers University; Ph.D., Rutgers University; Assistant Professor

Evans Booker, B.S., St. Augustine's College; M.S., Tuskegee Institute; Associate Professor
Etta C. Gravely, B.S., Howard University; M.S., North Carolina A&T State; Ed.D., UNC-Greensboro; Associate Professor
Vallie Guthrie, B.S., North Carolina A&T State University, M.S., Fisk University; Ed.D., American University; Associate Professor

Julius L. Harp, B.S., York College (Jamaica, NY); Ph.D., Howard University; Assistant Professor

Kenneth W. Hicks, B.S., Miami University (Ohio); Ph.D., Howard University, Professor

Lynda M. Jordan, B.S., North Carolina A&T State University; M.A., Atlanta University; Ph.D., Massachusetts Institute of Technology; Associate Professor

Alvin P. Kennedy, B.S. Grambling State University; Ph.D., University of California at Berkeley, Assistant Professor

Jothi V. Kumar, B.S., Annamala University; Ph.D., Kansas State University; Associate Professor

Claude N. Lamb, B.S., Mount Union College, M.S., North Carolina Central University; Ph.D., Howard University; Associate Professor

Abdul K. Mohammed, B.Sc., University of Benin (Nigeria); Ph.D., Louisiana State University; Assistant Professor

Alex N. Williamson, B.S., Jackson State University; Ph.D., University of Illinois at Urbana; Associate Professor and Chairperson

**Students are required to purchase supplemental materials for this course. General Education course.*

Department of English

Jimmy L. Williams
Chairperson

OBJECTIVES

The objectives of the English Department are: 1) to provide instruction in reading and writing skills, the humanities, linguistics and literature; 2) to prepare English majors and minors to teach, and to pursue graduate training in English and other professions; and 3) to train students in professional writing.

DEGREES OFFERED

English—B.A.

English, Secondary Education—B.S.

*English, Secondary Education—M.S.

*English, Afro-American Literature—M.A.

*See the Graduate Bulletin for descriptions of these programs.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate programs in the Department of English is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

English Major — The English major must complete 125 semester hours of University courses. Included in the 125 semester hours are 45 hours of English at the 200 level or above for the professional major. A minimum grade of "C" must be achieved in these courses.

Teaching Major in English — The teaching major in English must complete a minimum of 126 semester hours of University courses. Included in these 126 hours are 42 semester hours of English courses at the 200 level or above with grades of "C" or better.

The Minor in English (teaching and non-teaching) — Students desiring a minor in English must complete 24 semester hours in English at the 200 level or above. The required courses are ENGL 210, 220, 221, 300, 410, 430, 431, and 450.

CAREER OPPORTUNITIES

A degree in English prepares students to teach, to conduct research, to pursue graduate and professional degrees (such as law and library science), and to work in government, business, editing and numerous other jobs requiring mastery of the language.

CURRICULUM GUIDE FOR THE MAJOR IN ENGLISH BACHELOR OF ARTS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101 ¹	3	MATH 102 ¹	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100 and CHEM 110	4
PHED (Activity Course)	1	PHED (Activity Course)	1
ENGL 102	<u>2</u>	ENGL 210	<u>3</u>
	16		17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Elective	3	FOLA ²	3
FOLA ²	3	Social Science Elective	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	ENGL 221	3
ENGL 220	3	Elective	<u>3</u>
PSYC 320	<u>3</u>		15
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 300	3	ENGL 501	3
ENGL 500	3	ENGL 401	3
ENGL 430	3	ENGL 431	3
Electives	3	Elective	3
African-American Elective	<u>3</u>	ENGL Elective	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 450	3	ENGL 410	3
ENGL 435	3	ENGL 436	3
Electives	<u>9</u>	Electives	<u>8</u>
	15		14

Total Credit Hours: 125

CURRICULUM GUIDE FOR THE MAJOR IN TEACHING ENGLISH

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101 ¹	3	MATH 102 ¹	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100 & 110 (4) or	
PHED (Activity Course)	1	PHYS 110 & 111 (3) or EASC	
ENGL 102	2	201 (3)	3-4
	<u>16</u>	ENGL 210	3
		PHED 200	2
			<u>17-18</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 204 or 205	3	ENGL 221	3
ENGL 220	3	FOLA ²	3
FOLA ²	3	ENGL 201	3
ENGL 200	3	SPCH 250	3
PSYC 320	3	CUIN 300	2
ENGL 425	3	ENGL 300	3
	<u>18</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 430	3	ENGL 431	3
ENGL 436 or 435	3	ENGL 501	3
CUIN 301	2	ENGL 401	3
ENGL 500	3	CUIN 400	3
COMM 231, or 331, or 431	1	ENGL 410	3
African-American Elective		ENGL 460	3
(Non-English Course)	3		<u>18</u>
	<u>15</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 450	3	CUIN 624 ³	3
ENGL 627	3	CUIN 500 ³	3
CUIN 436	3	CUIN 560 ³	6
CUIN 526	3		<u>12</u>
	<u>12</u>		

Total Credit Hours: 125-126

¹ Students having to take MATH 100 (a remedial course) still must complete MATH 101 & 102 or their equivalent.

² French, Spanish or German through Intermediate level. Acceptable courses: FOLA 300, 301; SPAN 320, 321; GERM 422, 423. Eligibility to enroll in any one of these is established by placement test or by successful completion of elementary level of appropriate language.

³ Block Course.

COURSE DESCRIPTIONS FOR ENGLISH GENERAL EDUCATION

ENGL-100. Ideas and Their Expression I (Formerly English 2401) Credit 3(3-0)

An introduction to oral and written communications; provides the student with experience in writing short compositions, outlining written materials, improving reading, speaking skills. Offered Fall, Spring and Summer.

ENGL-101. Ideas and Their Expression II (Formerly English 2402) Credit 3(3-0)

A continuation of English 100 which provides the student with additional experience in expository writing, with intensive instruction in descriptive, argumentative writing, narrative composition; introduces student to the techniques of investigative writing and to the skills of reading different literary genres; provides opportunities for additional experience in oral expression. Prerequisite: ENGL 100. Offered Fall, Spring and Summer.

ENGL-102. Developmental Reading (Formerly English 2403) Credit 2(2-0)

Instruction and practice in methods of increasing rate of reading and techniques of comprehending written material; emphasis upon vocabulary study skills. Limited registration. Offered Fall and Spring.

ENGL-205. Topics in Literature Credit 3(3-0)

Study of selected topics in literature. Elective course primarily for non-English majors. Prerequisite: ENGL 101. Offered upon sufficient demand.

HUMANITIES

ENGL-200. Survey of Humanities I Credit 3(3-0)

A study of interrelationships of literature, music, and the fine arts; a study of master works, philosophical ideas, and artistic movements of Western Civilization, with attention given also to non-Western culture. Will survey cultures from ancient times to the end of the Renaissance. Prerequisite: ENGL 101. Offered Fall, Spring and Summer.

ENGL-201. Survey of Humanities II Credit 3(3-0)

A continuation of ENGL 200. Will begin with the Baroque period and will include Neo-Classicism. Romanticism, and modern modes of artistic expression. Prerequisites: ENGL 101 and HUMA 200. Offered Fall, Spring and Summer.

ENGL-202. The Humanities in America Credit 3(3-0)

A survey of the interrelationship of American and Afro-American literature, music, and art from colonial times to the present. The course will also include a study of the American historical, social, and philosophical experience. Prerequisite: ENGL 101. Offered upon sufficient demand.

ENGL-203. Humanities Perspectives of the South Credit 3(3-0)

A course to examine the South from the perspectives of its history, beliefs, literature, music, and art. Prerequisite: ENGL 101. Offered Fall and Spring.

ENGL-204. Topics in Humanities: A Multidisciplinary Course Credit 3(3-0)

Study of selected topics in literature, art, music, philosophy, and other branches of the humanities. Elective course primarily for non-English majors. Prerequisite: ENGL 101. Offered upon sufficient demand.

ENGL-420. Humanities III, Great Ideas of World Civilization Credit 3(3-0)

A seminar devoted to the identification, analysis, and appreciation of some of the basic ideas or conceptions which have underlain world culture in the arts, religion, philosophy, and social attitudes from ancient times to the present. Offered upon sufficient demand.

LANGUAGE AND COMPOSITION

ENGL-260. Expository Writing

Credit 3(3-0)

An intensive study of the basic expository modes of narration, definition, comparison/contrast, process, etc., with a special emphasis on their adaptation to professional writing in non-technical areas. Prerequisite: ENGL 101. Offered in Fall.

ENGL-261. Writing for Magazines

Credit 3(3-0)

A course designed to develop the student's mastery of basic magazine writing with instruction in the article types used most by magazines. Beginning with the profile and ending with the investigative article, the course will also pay particular attention to editing for print and the development of a magazine writing style. Prerequisite: ENGL 260. Offered in Spring.

ENGL-300. Advanced Composition

Credit 3(3-0)

A study of techniques of narrative, descriptive, expository and argumentative composition. Prerequisite: ENGL 101. Offered Fall, Spring and Summer.

ENGL-305. Grammar, Literature and Composition for Pre-Professional Students

Credit 3(3-0)

A course to refine the skills in grammar, literature, and composition that are particularly needed by pre-professional students. Recommended for students preparing for the GRE, LSAT, and NTE. Prerequisite: ENGL 101. Offered in Spring.

ENGL-310. Introductory Linguistics

Credit 3(3-0)

An introductory survey covering the nature of language; the various levels of linguistic analysis (phonology, morphology, syntax, and semantics); dialectology (regional and social); and comparative historical linguistics. Strongly recommended as preparation for ENGL 450 & 501. Prerequisite: ENGL 101. Offered in Fall.

ENGL-331. Writing for Science and Technology (Formerly English 460)

Credit 3(3-0)

Study and practice of the basic techniques of writing and editing scientific and technical materials for both the general audience and the specialist. Prerequisite: Junior standing. Offered Fall, Spring and Summer.

ENGL-450. Advanced English Grammar (Formerly English 2441)

Credit 3(3-0)

An intensive study of the structure of the English language with tolerance towards language dialects and levels as effective communication; emphasis placed upon a knowledge of grammar essential to teaching in the junior and senior high school. Prerequisite: ENGL 101. Offered in Fall.

ENGL-480. Editing

Credit 3(3-0)

A course designed to teach the general techniques of editing. Methods of checking completeness, integrity, clarification, style, and recognizing the need for substantial changes are included. Prerequisite: ENGL 305. Offered upon sufficient demand.

ENGL-490. Professional Writing Internship

Credit 6(1-10)

On-the-job training with an appropriate agency; compilation of a portfolio of high caliber. Prerequisites: ENGL 261 & 480. Offered upon sufficient demand.

ENGL-501. Introduction to the History of the English Language (Formerly English 2462)

Credit 3(3-0)

A course designed to develop the student's understanding of modern English syntax, vocabulary, etymology, spelling, pronunciation and usage. Offered in Spring.

LITERATURE

ENGL-210. Introduction to Literary Studies (Formerly English 2463) Credit 3(3-0)
Required of English majors and minors, open to others only with approval of instructor; the critical analysis, literary criticism, investigative and bibliographical techniques necessary to advanced study in English. This course is a prerequisite for all advanced courses in literature. Prerequisite: ENGL 100. Offered Fall and Spring.

ENGL-220. English Literature I (Formerly English 2437) Credit 3(3-0)
A survey of the literary movements and major authors of English literature in relation to the cultural history of England from Beowulf to 1798. Prerequisites: ENGL 101, HIST 100, 101. Offered in Fall.

ENGL-221. English Literature II (Formerly English 2438) Credit 3(3-0)
A continuation of ENGL 220 from 1798 to the Present. Prerequisites: ENGL 100, 101. Offered in Spring.

ENGL-333. Survey of African American Literature Credit 3(3-0)
The study of prose, poetry, and drama by American authors of African ancestry. Their works will be studied in relation to the cultural and literary traditions of their times. Dunbar, Chesnutt, Johnson, Cullen, Bontemps, Hughes, Wright, Ellison, Baldwin, Yerby, A. Walker, M. Walker, and other women writers will be included. Offered Fall, Spring and Summer. Prerequisite: ENGL 101.

ENGL-400. Survey of Dramatic Literature I (Formerly English 2450) Credit 3(3-0)
A survey course in the history, literature, criticism, and arts of the theatre to the nineteenth century. Prerequisite: ENGL 210. Offered upon sufficient demand.

ENGL-401. Survey of Dramatic Literature II (Formerly English 2451) Credit 3(3-0)
A continuation of English 400, from the nineteenth century to the present. Prerequisite: ENGL 210. Offered in Spring.

ENGL-410. Shakespeare (Formerly English 2452) Credit 3(3-0)
An introduction to a study of the works of William Shakespeare through a detailed examination of representative works selected from the major periods of his development as a dramatist. Prerequisite: ENGL 210. Offered in Spring.

ENGL-425. World Literature Credit 3(3-0)
A survey of selected major world writers from ancient times to the present. Offered in Fall.

ENGL-430. American Literature I (Formerly English 2455) Credit 3(3-0)
A study of the literary movements and major authors of American literature in relation to the cultural history of America from the Colonial Period to 1865. Prerequisites: ENGL 210, ENGL 200-201. Offered upon sufficient demand.

ENGL-431. American Literature II (Formerly English 2456) Credit 3(3-0)
A continuation of English 430, from 1865 - Present. Prerequisites: ENGL 210, ENGL 200-201. Offered in Spring.

ENGL-435. The Novel (Formerly English 2457) Credit 3(3-0)
A study of the novel as an art form, with attention to significant English novelists from 1750 to the present. Prerequisite: ENGL 210. Offered in Fall.

ENGL-436. Modern Poetry (Formerly English 2458) Credit 3(3-0)
A study of poetry as an art form, with attention to significant English and American poets of the twentieth century. Prerequisite: ENGL 210. Offered in Spring.

ENGL-445. Independent Study in English**Credit 3(3-0)**

Provides an opportunity for students to pursue independently in-depth study in literature, linguistics, or professional writing. Prerequisite: Second semester junior or senior standing, and prior consultation with department faculty. Offered Fall, Spring and Summer.

ENGL-460. Technology and the Teaching of English**Credit 3(3-0)**

Provides knowledge of how technology, especially the computer and non-print media, can be utilized effectively in the teaching of English (e.g., computer assisted instruction—hands-on experience included) and classroom management. Knowledge of various instructional strategies appropriate for diverse learners and learning styles. Development of appropriate professional attitudes and incorporation of research findings in the instructional program. Offered Spring. For English education majors only.

ENGL-475. British and American Literary History**Credit 3(3-0)**

A course designed to provide the student with the opportunity to develop a sense of the continuity of British and American literary history, supported by a reading of major works. Prerequisite: Senior standing. Offered upon sufficient demand.

ENGL-500. Literary Research and Criticism**Credit 3(3-0)**

Open only to junior and senior English majors and minors. Advanced study in the tools and techniques of literary research and critical analysis, emphasizes independent study, and a study of the major schools of criticism, and culminates in the completion of a study of a problem in literature. Offered in Fall.

DIRECTORY OF FACULTY

Jimmy L. Williams, B.A., Clark College; M.A., Washington University; Ph.D., Indiana University; Professor and Chairperson

Sandra Alexander, B.S., North Carolina A&T State University; M.A., Harvard University; Ph.D., University of Pittsburgh; Professor

Brian Benson, A.B., Guilford College; M.A., University of North Carolina at Greensboro; Ph.D., University of South Carolina; Professor

Audrey Forrest-Carter, B.A., Bennett College; M.A., North Carolina A&T State University; Ph.D., Miami University; Assistant Professor

Michael Greene, B.A., Duke University; M.A., Ph.D., Indiana University; Professor

Norman Jarrard, A.B., Salem College; M.A., University of North Carolina at Chapel Hill; Ph.D., University of Texas; Professor

Robert Levine, B.A., Queens College of the City University of New York; M.A., Ph.D., Cornell University; Professor

Ethel Taylor, A.B., Spelman College; M.A., Atlanta University; Ph.D., Indiana University; Professor

Jane Gibson Brown, B.A., Converse College, M.A. Vanderbilt University; Ph.D., University of Dallas; Associate Professor

Samuel Garren, B.A., Davidson College; M.A., Ph.D., Louisiana State University; Associate Professor

Wendy Greene, B.A., Wells College; M.A., Ph.D., Indiana University; Associate Professor

Opal Hawkins, B.S., Hampton Institute; M.S., University of Georgetown; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

Elon Kulii, A.B., Winston-Salem State University; M.S., North Carolina A&T State University; Ph.D., Indiana University; Associate Professor

Kathy Essick, B.A., University of North Carolina-Greensboro; M.A., North Carolina A&T State University; Ph.D., Indiana University of Pennsylvania; Assistant Professor.

Gibreel Kamara, B.A., M.A., North Carolina A&T State University; Ph.D., Temple University; Assistant Professor

Lucy Bolden, B.A., Bennett College; M.S., North Carolina A&T State University; Assistant Professor

Jeffrey D. Parker, B.A., University of North Carolina-Greensboro; M.A., North Carolina A&T State University; Ph.D., University of South Carolina; Assistant Professor

Department of Foreign Languages

Nita Matthews Dewberry
Acting Chairperson

OBJECTIVES

The objectives of the Department of Foreign Languages are to (1) develop facility in the listening, speaking, reading and writing of the foreign languages; (2) develop a better knowledge of foreign cultures and an appreciable awareness of one's own culture, (3) create a spirit of international understanding that will result in respectable attitudes toward individuals and national groups; (4) prepare students to teach second languages in elementary through secondary schools; (5) prepare and encourage students to continue further study and research in the major areas, foreign language literature and education; (6) provide students with experiences to develop communicative skills and competence requisite for personal fulfillment and challenging careers in which the foreign language study will be in full use or an asset.

DEGREES OFFERED

French—B.A.

French, Education—B.S.

French—M.S.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the Department of Foreign Languages is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

French—B.A. (Non-Teaching Major) — The curriculum in this area requires the student to complete a minimum of 124 semester hours of University courses. Included in the 124 hours are 36 semester hours of French in courses beyond the elementary level. (A minimum grade of "C" must be achieved in all French courses.)

French—B.S. (Teaching Major) — The curriculum for the teaching major in French requires that a student complete the courses and regulations as outlined by the School of Education for certification in the elementary and secondary schools. A student must complete a minimum of 124 semester hours of University courses. Included in the 124 hours are 36 semester hours of French in courses beyond the elementary level. (A minimum grade of "C" must be achieved in all French courses.)

Foreign Language Placement Examination

A foreign language placement examination will be administered to entering freshmen whose programs have a language requirement and who have taken at least two (2) consecutive years of the same foreign language in high school. The highest level in which a student can be placed is the intermediate I level. A student cannot satisfy a language requirement by taking this examination. The foreign language placement examination will be given in order to place students in the appropriate levels only.

A minor may be achieved in French or Spanish by students who complete a minimum of 18 semester hours in Spanish or French at the 300 level or above. If a student starts the French or Spanish minor at the elementary I level, a minimum of 24 semester hours must be completed.

ACCREDITATION

All Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education and approved by the North Carolina State Department of Public Instruction.

CAREER OPPORTUNITIES

In this time of growing internationalism, a degree in foreign languages has a high level of importance in many professional careers. For the language major, chances of employment in areas of government service, military service, teaching, international travel, law, business, industry and mass communications, to name but a few, are greatly enhanced by the training in foreign languages.

Foreign Language Study Abroad

North Carolina A&T State University through the Department of Foreign Languages offers Summer Study Abroad Programs to Costa Rica, France, Mexico and Gabon (Africa). Students may receive up to six (6) credit hours for courses successfully completed in these study abroad programs. All students participating in these programs are accompanied to the foreign countries by a program director (a faculty member of the Dept. of Foreign Languages).

Costa Rica: Qualified students may apply to participate in this five to six week summer study abroad program which is in conjunction with the University of Costa Rica in San José, Costa Rica.

France: In conjunction with EF Ecole Internationale de Francais in Nice, France, qualified students may apply for participation in this summer study abroad program.

Mexico: Qualified students may apply to participate in this summer study abroad program which is in conjunction with Cuauhnahuac Instituto Colectivo de Lengua y Cultura in Cuernavaca, Mexico.

Gabon (Africa): In conjunction with the University of Gabon in Gabon, Africa, qualified students may apply for participation in this program in order to acquire the francophone experience.

The department also offers a summer cultural enrichment program to **Paris, France.**

(All study abroad programs and cultural enrichment programs were developed by faculty within the Department of Foreign Languages at North Carolina A&T State University.)

CURRICULUM GUIDE FOR THE MAJOR IN FRENCH NON-TEACHING

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
SOCI 100	3	SOCI 101	3
BIOL 100	4	CHEM 100	4
FOLA 300	<u>3</u>	FOLA 301	<u>3</u>
	16		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 250	3	ENGL 201	3
ENGL 200	3	FOLA 411	3
FOLA 410	3	FOLA 416	3
FOLA 415	3	FOLA 105 or above	3
PSYC 320	3	PHED 200	2
FOLA 104 or above	<u>3</u>	Elective or Minor	<u>3</u>
	18		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA 400	3	FOLA 417	3
FOLA 505	3	FOLA 505 or 506	3
FOLA 320 or above	3	FOLA 321 or above	3
GEOG 210	3	Elective or Minor	<u>6</u>
Elective or Minor	<u>3</u>		15
	15		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA 508	3	FOLA Electives	6
FOLA Electives	3	GERM 103	3
GERM 102	3	Elective or Minor	<u>3</u>
Elective or Minor	<u>6</u>		12
	15		

Minimum Total Hours Required 124. Minimum Total French Hours Required 36.

A minimum grade of "C" must be achieved in all French courses.

CURRICULUM GUIDE FOR THE MAJOR IN FRENCH TEACHING

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
SOCI 100	3	SOCI 101	3
BIOL 100	4	CHEM 100	4
FOLA 300	<u>3</u>	FOLA 301	<u>3</u>
	16		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 250	3	ENGL 201	3
ENGL 200	3	FOLA 411	3
FOLA 410	3	FOLA 416	3
PHED 200	2	PSYC 320	3
FOLA 104 or above	3	FOLA 105 or above	3
FOLA 415	<u>3</u>	CUIN 300	<u>2</u>
	17		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA 400	3	FOLA 417	3
FOLA 505 or 506	3	FOLA 506	3
CUIN 301	2	CUIN 400	3
GEOG 210	3	FOLA 321 or above	3
FOLA 320 or above	3	Elective	<u>3</u>
Elective	<u>3</u>		15
	17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA 508	3	CUIN 500	3
CUIN 436	3	CUIN 527	3
CUIN 637	3	CUIN 560	<u>6</u>
FOLA 515	3		12
Elective	<u>2</u>		
	14		

Minimum Total Hours Required 124. Minimum Total French Hours Required 36.

A minimum grade of "C" must be achieved in all French courses.

COURSES WITH DESCRIPTION FOR FOREIGN LANGUAGES

FRENCH Undergraduate

FOLA-100. Elementary French I* (Formerly French 101, 102, 2500) Credit 3(3-0)
A course for beginners which emphasizes the four language skills—listening, speaking, reading, writing. Prerequisite: None. Offered in Fall and Spring.

FOLA-101. Elementary French II* (Formerly French 102, 103, 2501) Credit 3(3-0)
A continuation of FOLA 100 with further emphasis placed on the oral-aural approach. Prerequisite: FOLA 100, or equivalent. Offered in Fall and Spring.

FOLA-300. Intermediate French I* (Formerly French 201, 2520) Credit 3(3-0)
A course which consists of a brief review of pronunciation. Grammar is stressed with emphasis on cultural reading. Prerequisites: FOLA 100 and 101, or two units of high school French. Offered in Fall.

FOLA-301. Intermediate French II* (Formerly French 202, 2521) Credit 3(3-0)
This course is a continuation of FOLA 300. Stress is placed on grammar, cultural reading and conversation. Prerequisite: FOLA 300, or equivalent. Offered in Spring.

FOLA-400. Phonetics (Formerly French 203, 2522) Credit 3(3-0)
A course in French sounds and diction. Required of all students majoring and minoring in French. Recommended for those who wish to improve pronunciation. Prerequisites: FOLA 300 and 301. Offered in Fall or Spring.

FOLA-402. French for Reading Comprehension Credit 3(3-0)
Development of skills needed for reading competency and interpretation; preparation for French reading proficiency examinations; emphasis placed on vocabulary development; mastery of all aspects of noun/pronoun character and modifiers; knowledge of tense, mood and form of verb structure; reading comprehension analysis and evaluation of selected passages. Readings will be in areas as the humanities, mathematics, social and natural sciences. Prerequisite: Successful completion of Foreign Language requirements in major area or consent of instructor. Offered in Fall or Spring and by demand.

FOLA-410. Intermediate Oral French (Formerly French 204, 2523) Credit 3(3-0)
Intermediate oral French course which prepares students for FOLA 411. It is designed to enable students to understand lectures and conversations of average tempo. Prerequisites: FOLA 300 and 301. Offered in Fall or Spring.

FOLA-411. Advanced Oral French (Formerly French 205, 2524) Credit 3(3-0)
A course which offers to students intensive training in self-expression and an opportunity to improve pronunciation, diction, reading and speaking. Prerequisite: FOLA 410. Offered in Fall or Spring.

FOLA-415. Survey of French Literature I (Formerly French 301, 2540) Credit 3(3-0)
A general introduction to the study of French literature. This course gives a clear idea of the great periods and main tendencies in history of French thought and letters from 842 to the 18th century. Offered in Fall or Spring.

FOLA-416. Survey of French Literature II (Formerly French 301, 2541) Credit 3(3-0)
A continuation of French literature from the 18th century to the present. Offered in Fall or Spring.

FOLA-417. Literature of Afro-French Expression **Credit 3(3-0)**
Introduction to the literary style and currents of thoughts in poetry and prose of selected Afro-French writers in the Caribbean; special attention to "Negritude" as reflected in major works of selected Afro-French and Francophone African authors. Prerequisite: French 301 or equivalent, or consent of instructor. Offered in Fall or Spring.

FOLA-505. Advanced French Composition **Credit 3(3-0)**
(Formerly French 401, 2560)
Advanced course in oral and written self-expression in French. Special attention to vocabulary building, free composition and conversation, prepared and improvised, covering the many phases of everyday activities. Offered in Fall or Spring.

FOLA-506. Advanced French Grammar and Composition **Credit 3(3-0)**
(Formerly French 402, 2561)
Course designed to give the students practical training in the use of advanced French grammar and reading. Offered in Fall or Spring.

FOLA-508. French Civilization (Formerly French 404, 2562) **Credit 3(3-0)**
A general survey of the history of France, with emphasis on the social, political and economic development designed to give the students an understanding of present conditions and events. A detailed study of such French institutions as art, music, and education. Course is also offered in conjunction with reports of collateral readings. Offered in Fall or Spring.

FOLA-515. Structural Linguistic in the Teaching of French **Credit 3(3-0)**
A course which applies structural linguistic forms, doctrine and methodology to the teaching of French Historical development of the French language. Presentation of dialogues and drills in French. Emphasis on phonemics, morphology and syntax. Offered in Fall or Spring.

Advanced Undergraduate and Graduate

FOLA-602. Second Language Teaching and Learning **Credit 3(3-0)**
(Formerly French 501, 271)
This course includes theoretical positions and practices in second language teaching and learning. Special features of the course will be practice, activities, and strategies for teaching and learning a new language and for developing the proficiency level(s) in a second language. Prerequisite: Junior standing. Offered by demand.

FOLA-603. Oral Course for Teachers of Foreign Languages **Credit 3(3-0)**
(Formerly French 502)
Designed for teachers of foreign languages to improve pronunciation. Offered by demand.

FOLA-606. Research in the Teaching of Foreign Languages **Credit 3(3-0)**
(Formerly French 503, 2573)
Open to students who are interested in undertaking the study of a special problem in the teaching of a foreign language. Offered by demand.

FOLA-607. French Literature of the Seventeenth Century **Credit 3(3-0)**
(Formerly French 302, 2574)
Course presents Classicism through masterpieces of Corneille, Racine, Moliere and other authors of the "Golden Period" in French letters. Offered by demand.

FOLA-608. French Literature in the Eighteenth Century **Credit 3(3-0)**
(Formerly French 303, 2575)
To study in particular the life and works of Montesquieu, Voltaire, and Rousseau, and the Encyclopedists. Offered by demand.

- FOLA-609. French Literature of the Nineteenth Century**
(Formerly French 304, 2576) **Credit 3(3-0)**
 Study of the great literary currents of the Nineteenth Century Romanticism and Realism. Offered by demand.
- FOLA-610. The French Theatre (Formerly French 504, 2577)** **Credit 3(3-0)**
 A thorough study of the French theatre from the Middle Ages to the present. Offered by demand.
- FOLA-612. The French Novel (Formerly French 505, 2578)** **Credit 3(3-0)**
 A study of the novel from the Seventeenth Century to the present. Offered by demand.
- FOLA-614. French Syntax (Formerly French 506, 2579)** **Credit 3(3-0)**
 Designed to teach grammar on the advanced level. Offered by demand.
- FOLA-616. Contemporary French Literature**
(Formerly French 305 and 2542, 2580) **Credit 3(3-0)**
 Course deals with the chief writers and literary currents from 1900 to the present. Offered by demand.
- FOLA-618. Selected Afro-French Poets** **Credit 3(3-0)**
 A study and analysis of the most representative works of Afro-French poets of South America, Africa and the Caribbean. Prerequisites; FOLA 410, 411, 412 or consent of instructor. Offered by demand.

Graduate

- FOLA-720. Advanced Reading and Composition**
(Formerly French 601 and 2580, 2585) **Credit 3(3-0)**
 An advanced study of the content and stylistics of selected contemporary writings. Assigned topics for compositions and explications de textes. Offered by demand.
- FOLA-722. Romantic Movement in France**
(Early Nineteenth Century) **Credit 3(3-0)**
 Background study of romanticism in works of Chateaubriand and Madame de Stael; emphasis placed on Lamartine, Hugo, Vigny and Musset; other writers and genres of the period will be studied. Offered by demand.
- FOLA-724. Seminar in Foreign Languages**
(Formerly French 603 and 2582, 2587) **Credit 3(3-0)**
 Readings and special topics in French. Presentations from students, faculty and guest lectures. Papers showing research techniques in literary study are required of all candidates for a degree with concentration in French. Offered by demand.
- FOLA-726. Contemporary Literary Criticism**
(Formerly French 604 and 2583, 2587) **Credit 3(3-0)**
 Methods and purposes of literary criticism and of French literary critics. Offered by demand.
- FOLA-728. Independent Study in Foreign Languages**
(Formerly French 258, 2589) **Credit 3(3-0)**
 Independent study and research in a special area of the foreign language. Offered by demand.

*Students are required to purchase supplemental materials for this course.

General Education course.

SPANISH
Undergraduate

FOLA-104. Elementary Spanish I* (Formerly Spanish 101, 102, 2504) Credit 3(3-0)
A course for beginners which consists of grammar, composition, translation, practice in pronunciation and use of the spoken language. Offered in Fall and Spring.

FOLA-105. Elementary Spanish II* (Formerly Spanish 102, 103, 2505) Credit 3(3-0)
Continuation of Elementary Spanish 104. Attention is given to advanced grammar. Prerequisite: FOLA 104 or equivalent. Offered in Fall or Spring.

FOLA-320. Intermediate Spanish I* (Formerly Spanish 201, 2530) Credit 3(3-0)
Review of grammar, composition and conversation. Prerequisite: FOLA 105 or two units of high school Spanish. Offered in Fall.

FOLA-321. Intermediate Spanish II* (Formerly Spanish 202, 2531) Credit 3(3-0)
Continuation of FOLA 320. Prerequisite: FOLA 320 or equivalent. Offered in Spring.

FOLA-401. Spanish for Reading Comprehension Credit 3(3-0)
Development of skills needed for reading competency and interpretation; preparation for Spanish reading proficiency examination, emphasis placed on vocabulary development; mastery of all aspects of noun/pronoun character and modifiers; knowledge of tense, mood and form of verb structure; reading comprehension analysis and evaluation of selected passages. Readings will be in such areas as the humanities, the sciences, social and natural sciences and other areas of students' interests. Prerequisite: FOLA 321. Offered in Fall or Spring and by demand.

FOLA-440. Phonetics (Formerly Spanish 202, 2532) Credit 3(3-0)
A systematic analysis of speech sounds, and the operation of phonetic laws. Prerequisite: Spanish 105 or equivalent. Offered by demand.

FOLA-441. Intermediate Conversation (Formerly Spanish 204, 2533) Credit 3(3-0)
Practice and drill in oral Spanish based principally on topics of current interest. Prerequisite: FOLA 105 or equivalent. Offered by demand.

FOLA-442. Introduction to Spanish Literature (Formerly Spanish 250, 2534) Credit 3(3-0)
Readings of representative authors of Spain. Offered by demand.

FOLA-450. La Cultura Hispanica (Formerly Spanish 301, 2543) Credit 3(3-0)
A course which covers the significant elements of Hispanic Civilization: geography, history, literature, and economics of the Spanish people. Offered by demand.

FOLA-451. Survey of Spanish Literature I (Formerly Spanish 302, 2544) Credit 3(3-0)
A survey of Spanish literature from the Cid through the golden age with assigned readings and reports. Offered by demand.

FOLA-452. Survey of Spanish Literature II (Formerly Spanish 303, 2545) Credit 3(3-0)
A survey of Spanish literature from the seventeenth century to the present. Offered by demand.

FOLA-455. Syntax (Formerly Spanish 304, 2546) Credit 3(3-0)
Systematic study of Spanish grammar with conversational and other exercises based on contemporary authors. Offered by demand.

GERMAN

FOLA-102. Elementary German I*

(Formerly German 101, 102, 2502)

Credit 3(3-0)

Fundamentals of pronunciation and grammar. Attention given to prepared and sight translations and vocabulary building. Offered in Fall and Spring.

FOLA-103. Elementary German II*

(Formerly German 102, 103, 2503)

Credit 3(3-0)

Continuation of emphasis on grammar, vocabulary building, prepared and sight translations. Maximum attention given to graded readings in German prose and drama. Offered in Fall and Spring.

FOLA-202. German Readings in the Natural Social Sciences and

Technical Fields (Formerly German 205, 206, 529, 425)

Credit 3(3-0)

Individualized readings in the Natural, Social Sciences and Technical fields for students desirous of developing competency in German. Offered in Fall or Spring and by demand.

FOLA-420. Conversational German (Formerly German 201, 2526)

Credit 3(3-0)

Intensive practice in everyday German is provided. Prerequisites: German 102, 103, or approval of instructor. Offered by demand.

FOLA-422. Intermediate German I (Formerly German 202, 2527)

Credit 3(3-0)

This course is open to students who have completed German 102 and 103. The students read a cross-section of the simpler writings in German literature and German newspapers. Offered in Fall or Spring and by demand.

FOLA-423. Intermediate German II (Formerly German 203, 2528)

Credit 3(3-0)

Continuation of FOLA 422. Readings from German literature. Offered in Fall or Spring and by demand.

FOLA-427. Survey of German Literature (Formerly German 2530)

Credit 3(3-0)

A general introduction to the study of German literature. This course is intended to give an overall picture of German literature and an opportunity to read outstanding works not offered in other German courses. Offered by demand.

RUSSIAN

FOLA-106. Elementary Russian I* (Formerly Russian 2506)

Credit 3(3-0)

An elementary course for beginners which consists of grammar translation, practice in pronunciation and limited use of the spoken language. Prerequisite: None. Course offered by demand.

FOLA-107. Elementary Russian II* (Formerly Russian 2507)

Credit 3(3-0)

Continuation of Elementary Russian 106. Attention is given to more advanced grammar. Reading in Russian is stressed. Prerequisite: FOLA 106. Course offered by demand.

*Students are required to purchase supplemental materials for these courses.

DIRECTORY OF FACULTY

Foreign Languages

Brigitte E. Archibald, B.A., The King's College; M.A., Middlebury College at Mainz, Germany; Ph.D., University of Tennessee; Associate Professor of German

Nita M. Dewberry, B.A., North Carolina State University at Raleigh; M.A., University of North Carolina at Chapel Hill; Ph.D., University of North Carolina at Chapel Hill- Assistant Professor of Spanish and Acting Chairperson, Department of Foreign Languages

Eva S. George, B.A., Allen University; M.A., New York University; Instructor of French

Mark Groundland, B.A., University of Delaware; M.A., University of Delaware; Instructor of Spanish

Mercedes Guijarro-Crouch, B.A., University of Seville, Spain; M.A., University of Houston; Ph.D., University of North Carolina at Chapel Hill; Assistant Professor of Spanish

Carl E. Henderson, B.A., Morehouse College; M.A., Ph.D., Case Western Reserve University; Associate Professor of French

Chinedum Emmanuel Ikegwu, B.A., University of the District of Columbia; M.A., Antioch School of Law; Ph.D., Howard University; Assistant Professor of French

Elie Mbumina, B.S., Winston-Salem State University; M.S., North Carolina A&T State University; Language Lab Director and Instructor of French

Patricia Watkins, B.A., University of Panama; M.A., University of South Florida; Instructor of Spanish

Department of History

Peter V. Meyers
Chairperson

OBJECTIVES

The Department of History offers students a knowledge of the past which enables them to better understand today's world and to prepare for the future. The Department also helps students develop skills in research, analysis, decision-making, and communication. These skills prepare students for successful careers, constructive participation in civic affairs, and lifelong learning. In short, the Department of History emphasizes the personal development of each student.

The specific objectives of the History Department are: 1) to contribute to the general education of students by providing the historical, geographical, and philosophical background for studying the arts, the sciences, and technical subjects; 2) to give historical content and professional skills to students preparing for careers in fields such as education, law, religion, international affairs, social service, journalism, history, or government; 3) to offer a curriculum which allows students to pursue the history of all areas of the world; 4) to offer a course of study leading to the Baccalaureate Degree in History, History Education, or Social Science Education; 5) to offer a course of study leading to the Master of Science Degree in Education with a concentration in either History or Social Science; and, 6) to provide instruction for students preparing for doctoral programs.

In carrying out its aims and objectives, the History Department offers a broad range of courses in history as well as courses in geography and philosophy. To help ensure student success the Department assigns each student major to an advisor and it is particularly important that students consult their advisors when planning their educational programs. The Department also offers students a variety of extracurricular opportunities to enrich their college experiences. These activities include the History Club, the *History Magazine*, the Phi Alpha Theta International Honor Society in History, and numerous public lectures. Finally, the Department participates in the Honors Program of the College of Arts and Sciences which enables outstanding students to work closely with faculty members on special course and research assignments.

DEGREES OFFERED

History—B.A.

History, Secondary Education—B.S.

Social Science, Secondary Education—B.S.

* History, Secondary Education—M.S.

* Social Science, Secondary Education—M.S.

**See the Bulletin of the Graduate School*

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the History Department is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

History Major — A student in the History Major must complete 124 semester hours of University courses. Included in the 124 hours are 30 hours in history courses at the 200 level or above and 18 hours in the social sciences. A minimum grade of "C" must be achieved in these history and social science courses. The History Major also allows students to minor in another subject area and thus broaden their career preparation. The Department has developed specific minor concentrations for ministers, journalists, and those interested in Afro-American studies, mass media, or international economics.

Teaching Major in History — The Teaching Major in History requires 126 semester hours of University courses. Included in the 126 semester hours are 30 hours in history courses at the 200 level or above and 18 hours in the social sciences. This major also includes 26 hours of education courses and field experience as a student teacher. Students in this major must earn at least a "C" in all history, social science, general education, and professional education courses.

Students in the History Education program are provided an opportunity to:

- Become knowledgeable about man's past experiences;
- Study the history of major world civilizations and understand the impact of various groups, institutions, and nations on global development;
- Understand the social, political, economic, and cultural forces at work in contemporary societies;
- Become more sensitive to the relationships between history and the other social science disciplines;
- Develop an understanding of the nature of history and of the scientific methodology of historical research;
- Develop competencies essential for effective teaching of history and social studies in secondary schools;
- Develop proficiency in using computer software and appropriate peripheral devices to enhance instruction;
- Qualify for initial certification in History or Social Studies in North Carolina; and,
- Prepare for further study at the graduate level and understand the need for life-long learning.

Teaching Major in Social Science — The Teaching Major in Social Science is an interdisciplinary program of study. Students pursuing this program must complete 126 semester

hours of University courses. Included in the 126 hours are 21 hours in history courses at the 200 level or above and 24 hours in other social science courses. This major also includes 26 hours of education courses and field experience as a student teacher. Students in this major must earn at least a "C" in all history, social science, general education, and professional education courses.

Students in the Social Sciences program are provided an opportunity to:

- Develop an understanding of the nature of the social sciences and the contributions of social science skills and insights to societal well-being;
- Develop a proficiency in computer skills, geography skills and in the skills needed for research, problem solving, decision-making, and historical inquiry;
- Understand the social, political, economic, and cultural forces at work in contemporary societies;
- Study the history of major world civilizations and understand the impact of various groups, institutions, and nations on global development;
- Acquire the skills and outlook necessary for constructive participation in democratic life;
- Develop competencies essential for effective teaching of social studies in secondary schools;
- Develop proficiency in using computer software and appropriate peripheral devices to enhance instruction;
- Qualify for initial certification in Social Studies in North Carolina; and, — Prepare for further study at the graduate level and understand the need for life-long learning.

The Minor in History — Students desiring to minor in history must complete 18 semester hours in history at the 200 level or above including HIST 204, 205, 303 and 304.

The Minor in African and African-American History — The Minor in African and African American History consists of 18 semester hours of history courses distributed as follows:

Required Courses: 12 hours

HIST 215: History of Africa to 1800

HIST 216: History of Africa Since 1800

HIST 310: The Afro-American in the United States to 1877

HIST 311: The Afro-American in the United States Since 1877

Elective Courses: 6 hours to be selected from the following:

HIST 328: U.S. Slavery, 1619-1865

HIST 412: Modernization in Africa from 1920 to the Present

HIST 416: History of Black Culture in the United States

HIST 615: Seminar in the History of Black America

HIST 616: Seminar in African History

HIST 617: Readings in African History

ACCREDITATION

All teacher education programs are accredited by the National Council for the Accreditation of Teacher Education and are approved by the State Department of Public Instruction.

CAREER OPPORTUNITIES

The undergraduate degree program in History, when combined with an appropriate minor, leads to careers in journalism, business, archives and museums, international affairs, and government service, among others. It also prepares students for law school, theological seminary, and other graduate and professional school programs.

The undergraduate and graduate education majors prepare students to teach history or the social sciences in secondary schools. Businesses also find that teacher education majors make good human relations specialists, personnel directors, technical writers, sales managers, directors of training programs, and administrators.

CURRICULUM GUIDE FOR THE MAJOR IN HISTORY

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 100 or CHEM 100 and 110	4	BIOL 101 or CHEM 101 and 110	4
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
PHED 101 or 200	1-2	PHED 101 or 200	1-2
ENGL 102	<u>2</u>	SPCH 250	<u>3</u>
	16-17		17-18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 204	3	HIST 205	3
HIST 250	3	POLI 200 or POLI 210	3
PSYC 320	3	Electives (Social Science) ¹	3
FOLA	3	FOLA	3
ENGL 200	3	ENGL 201	<u>3</u>
HIST 260 or 261 or 262	<u>3</u>		15
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 303	3	HIST 304	3
HIST 310	3	HIST 311	3
Electives (Social Science) ¹	6	Electives or Minor ²	6
ECON 300 or ECON 301	<u>3</u>	HIST Elective ³	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 305 or SOCI 302	3	Electives or Minor ²	<u>13</u>
HIST Electives ³	6		13
Electives or Minor ²	<u>6</u>		
	15		

Total Credit Hours: 124-126

¹ 9 hrs. - Students may take any Geography, Political Science, or Sociology courses for which they meet the prerequisites.

² 25 hrs. - Students may take any courses offered at the University for which they meet the prerequisites. The Department encourages students to use part of this block of free electives to develop a minor of 18 hours in another discipline.

³ 9 hrs. - HIST 208, 209, 215, 216, 220, 225, 230, 270, 271, 300, 302, 305, 306, 307, 312, 320, 321, 327, 328, 330, 331, 332, 334, 401, 402, 405, 407, 410, 412, 416, 420, 430, 442, or 450. Seniors may also choose from HIST 600, 603, 605, 606, 607, 610, 615, 616, 617, 620, 625, 626, 630, 631, or 633.

CURRICULUM GUIDE FOR THE MAJOR IN HISTORY EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 100	4	CHEM 100 and 110	4
ENGL 100	3	or EASC 201	3
MATH 101	3	or PHYS 110 and 111	3
HIST 100	3	ENGL 101	3
PHED 101	1	MATH 102	3
PHED 200	<u>2</u>	SPCH 250	3
	16	HIST 101	<u>3</u>
			15-16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 204	3	HIST 205	3
HIST 250	3	POLI 200	3
PSYC 320	3	HIST 260 or 261 or 262	3
CUIN 300	2	CUIN 301	2
FOLA	3	FOLA	3
ENGL 200	<u>3</u>	ENGL 201	<u>3</u>
	17		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 303	3	HIST 304	3
HIST Elective ¹	3	SOCI 100	3
CUIN 400	3	CUIN 436	3
ECON 300	3	ECON 301	3
HIST 210	<u>3</u>	HIST Elective (Non-Western) ²	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 536	4	CUIN 500	3
HIST Electives ¹	9	CUIN 560	6
SOCI 200	3	CUIN 624	<u>3</u>
Electives ³	<u>2-3</u>		12
	18-19		

Total Credit Hours: 125-127

¹ 12 hrs. - HIST 208, 209, 215, 216, 220, 225, 230, 270, 271, 300, 302, 305, 306, 307, 310, 311, 312, 320, 321, 327, 328, 330, 331, 332, 334, 401, 402, 405, 407, 410, 412, 416, 420, 430, 442, or 450. Seniors may also choose from HIST 600, 603, 605, 607, 610, 615, 616, 617, 620, 625, 626, 630, 631, or 633.

² 3 hrs. - HIST 215, 216, 320, 327, 330, 331, 332, or 412. Seniors may also choose from HIST 616, 617, or 620.

³ 2-3 hrs. - Students may take any course offered at the University for which they meet the prerequisites.

CURRICULUM GUIDE FOR THE MAJOR IN SOCIAL SCIENCE EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 100	4	CHEM 100 and 110 or	4
ENGL 100	3	EASC 201 or	3
MATH 101	3	PHYS 110 and 111	3
HIST 100	3	ENGL 101	3
PHED 101	1	HIST 101	3
PHED 200	<u>2</u>	SPCH 250	3
	16	MATH 102	<u>3</u>
			15-16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 204	3	HIST 205	3
HIST 250	3	POLI 200	3
PSYC 320	3	HIST 260 or 261 or 262	3
CUIN 300	2	CUIN 301	2
FOLA	3	FOLA	3
ENGL 200	<u>3</u>	ENGL 201	<u>3</u>
	17		17

Junior

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 303	3	HIST 304	3
SOCI 100	3	SOCI 200	3
CUIN 400	3	CUIN 436	3
ECON 300	3	ECON 301	3
HIST 210	<u>3</u>	HIST (Non-Western) ¹	3
	15	Electives (Social Science) ²	<u>3</u>
			18

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 536	4	CUIN 500	3
HIST Electives ³	3	CUIN 560	6
Electives (Social Science)	6	CUIN 624	3
Electives ⁴	<u>2-3</u>		<u>12</u>
	15-16		

Total Credit Hours: 125-127

¹ 3 hrs. - HIST 215, 216, 320, 327, 330, 331, 332, or 412. Seniors may also choose from HIST 616, 617, or 620.

² 9 hrs. - Students may take any Geography, Economics, Political Science, or Sociology course for which they meet the prerequisites.

³ 3 hrs. - HIST 208, 209, 215, 216, 220, 225, 230, 270, 271, 300, 302, 305, 306, 307, 310, 311, 312, 320, 321, 327, 328, 330, 331, 332, 334, 401, 402, 405, 407, 410, 412, 416, 420, 430, 442, or 450. Seniors may also choose from HIST 600, 603, 605, 606, 607, 610, 615, 616, 617, 620, 625, 626, 630, 631, or 633.

⁴ 2-3 hrs. - Students may take any course offered at the University for which they meet the prerequisites.

COURSES WITH DESCRIPTION FOR HISTORY

HIST-100. History of World Civilizations-Part I **Credit 3(3-0)**

A survey of the social, political, economic, religious, and cultural developments in world civilizations from the beginnings in the ancient world through the 16th century.

HIST-101. History of World Civilizations-Part II **Credit 3(3-0)**

A continuation of the social, political, economic, religious, and cultural developments in world civilizations from the 17th century to the present.

HIST-204. U.S. History From 1492-1877 **Credit 3(3-0)**

Examines the basic diplomatic, political, economic and socio-cultural forces in the formation and development of the United States to 1877. Emphasis is placed upon political developments within a broad economic, social and cultural context.

HIST-205. U.S. History Since 1877 **Credit 3(3-0)**

Continues the examination of basic diplomatic, political, economic and socio-cultural forces in the development of the United States since 1877. Study of these major historical elements is pursued in an effort to help students to better understand the problems and challenges of contemporary American life, both domestic and foreign.

HIST-208. History of North Carolina **Credit 3(3-0)**

A general survey of North Carolina from colonial times to the present.

HIST-209. The American Military Experience **Credit 3(3-0)**

This course is designed primarily to enable the student to understand better the role played by the armed forces in American society today through a study of the origins and development of military institutions, traditions, and practices in the United States, 1775 to the present.

HIST-215. History of Africa to 1800 **Credit 3(3-0)**

A general survey of the history of Africa to 1800. Major areas of study include: the genesis of man in Africa, in the ancient world, early East and West civilizations, and the coming of Europe.

HIST-216. History of Africa Since 1800 **Credit 3(3-0)**

A general survey of the history of Africa since 1800. Major areas of study include: the slave trade, the underdevelopment of Africa, Western imperialism and the African partition, and the growth of nationalism.

HIST-220. History of Science and Technology **Credit 3(3-0)**

A survey of major scientific discoveries and technological innovations since the Scientific Revolution. Special attention will be paid to the Newtonian mechanistic world view, theories of evolution, relativity, industrial revolution, medical advances, nuclear energy, computers and robotics. The social, economic, and ethical impact of modern scientific and technical discoveries will also be discussed.

HIST-225. America in the 1960s **Credit 3(3-0)**

This course surveys and analyzes the various movements which made the 1960s one of the most important and tumultuous decades in American history. Special emphasis will be placed on the civil rights movement, opposition to the Vietnam War, environmentalism, the youth culture, and feminism. Attention will also be given to the continuing influence of the 1960s on the development of American society.

HIST-230. History of Modern Medicine **Credit 3(3-0)**

This course surveys the development of modern medical theories and practices, the professional development of physicians and nurses, the impact of technology on health care, the rise of hospitals, the intersections between society and medicine, factors affecting wellness, and the current problems facing the American health care system. Attention will also be given to the ethical dilemmas faced by doctors and nurses in this age of high tech health.

HIST-250. The Nature, Study, and Writing of History **Credit 3(3-0)**

The course includes material and presentations leading to an understanding of the basic nature of history, how to study it, methods and techniques in researching and writing it, basic computer and quantification skills, and more summarily, historiography and philosophies of history.

HIST-270. Introduction to Museums **Credit 3(3-0)**

This course introduces the student to the collecting and educational functions of the museum. Students will learn how museum professionals research, interpret and exhibit the holdings of a museum for the benefit of the community. Students will gain experience in developing their own exhibits. Students will also have the opportunity to visit local historical projects, and museums to study how these agencies carry out mandated duties.

HIST-271. Museum Practice and Collection Maintenance **Credit 3(3-0)**

This course introduces students to the duties of museum registrars, curators, conservationists, and administrators. Students will learn how to catalog and preserve the items in a museum's collection. Students will also visit other local museums to gain greater knowledge of museum operations.

HIST-300. Ancient History **Credit 3(3-0)**

A history of civilizations from the beginnings in the Near East and Egypt through Hellenism and the Roman Empire.

HIST-302. The Pre-Modern West **Credit 3(3-0)**

A survey of major developments in the Mediterranean and Western Europe from the origins of the Roman Empire through the end of the Middle Ages.

HIST-303. Early Modern Europe: Renaissance to 1815 **Credit 3(3-0)**

A survey of major trends in the development of early modern Europe. Topics to be discussed include: Renaissance, Reformation, Scientific Revolution, Enlightenment, Absolutism, and the French Revolution.

HIST-304. Modern Europe Since 1815 **Credit 3(3-0)**

A survey emphasizing main trends in European development including political and social impact of the French Revolution, Industrial Revolution, authoritarianism vs. liberalism,

church vs. state, nationalism, imperialism, World Wars I and II, Communism, Nazism, and present-day Europe.

HIST-305. Socialism Since Karl Marx

Credit 3(3-0)

This course analyzes the transformation of socialist thought and practice since the time of Marx. Special attention will be devoted to Marxist doctrines, nineteenth century Revisionism, Social Democracy, and twentieth century Communism.

HIST-306. History of Women Since 1800

Credit 3(3-0)

This course will trace the changes in female self-images and roles since the early 19th century in Europe and the United States. It will concentrate upon the growth of new educational and occupational opportunities for women, changing concepts of motherhood, and the rise of female protest movement.

HIST-307. The Historical Origins of Environmental Crises

Credit 3(3-0)

This course will deal with man's changing philosophical and technological relationship with his natural environment since the start of the Industrial Revolution.

HIST-310. The Afro-American in the United States to 1877

Credit 3(3-0)

A survey of the history of Afro-Americans in the United States from the African background through the Civil War. Emphasis is on American slavery, the abolition movement, the free black community, Civil War, Emancipation, and Reconstruction.

HIST-311. The Afro-American in the United States Since 1877

(A continuation of History 310)

Credit 3(3-0)

Emphasis is placed upon Afro-American leadership, organizations, achievement, and the struggle of blacks for equality in America since 1877.

HIST-312. History of Religions

Credit 3(3-0)

A course that surveys the origin and development of the traditional religions of India and China and the three "Religions of the Book:" Judaism, Christianity, and Islam.

HIST-320. African History as Seen Through Art and Archaeology

Credit 3(3-0)

By drawing upon the African art collections of the Mattye Reed African Heritage Center and other museums, this course will demonstrate the relevance of material culture collections—art, artifacts and archaeological findings—in the documentation of African history.

**HIST-321. Cultural History, Ethnicity, and Ethnographic Collections
in America**

Credit 3(3-0)

By drawing upon the ethnographic and multicultural collections of museums in North Carolina, students will become familiar with the role that museums can play in documenting and interpreting the culturally diverse history of the United States.

HIST-327. History of Latin America

Credit 3(3-0)

A survey of the history of Latin America from the pre-Columbian civilizations through the colonial empires and independence to the present day.

HIST-328. U.S. Slavery, 1619-1865

Credit 3(3-0)

A survey of the development of the institution of slavery in the United States from the seventeenth century to the ratification of the Thirteenth Amendment in 1865. Major themes stressed will include: slavemongering, slavery as a labor system, profitability of slavery, slave society, slave resistance to his status, and psychology of slaveholders.

HIST-330. History of the Far East to 1800

Credit 3(3-0)

A study of the history and culture of the Chinese, Japanese, and Vietnamese peoples from the early classical civilizations to the middle Ch'ing.

- HIST-331. History of the Far East Since 1800** **Credit 3(3-0)**
 Areas of study include: traditional China under the Ch'ing the impact of the West, feudal Japan, modernization in Meiji Japan, the Chinese Revolutions, and the Chinese model in Vietnam.
- HIST-332. The Modern Middle East** **Credit 3(3-0)**
 This course will focus on the Middle East from the mid 19th century to present. Areas of study will include: the nature of Islamic society; the rise of nationalism and independence movements; the creation of the state of Israel, and the Arab-Israeli conflict.
- HIST-334. Honors in History** **Credit 3(3-0)**
 Intensive reading and study or research in the field of history for departmental majors with a 3.0 average.
- HIST-401. Old Testament History and Literature** **Credit 3(3-0)**
 A survey of the books sacred to Judaism, Christianity, and Islam commonly called the Old Testament, in the context of the history of the people of Israel who composed them.
- HIST-402. The Rise of Christianity** **Credit 3(3-0)**
 A historical study of the origins and development of the Christian Church from its beginnings to the end of the ancient world (around 476 A.D.). The political, social, economic, intellectual, and religious environment will be considered equally along with the internal development of Christian institutions, beliefs, and practices.
- HIST-405. History of England** **Credit 3(3-0)**
 This course concentrates on English history since 1688. Special attention is given to the following topics: Glorious Revolution, industrialization, imperialism, decolonization, Victorianism, Ireland, and the current crisis in English society.
- HIST-407. American Diplomatic History Since 1900** **Credit 3(3-0)**
 American foreign policy and diplomacy from the Spanish-American War to the present. Emphasis on the impact of foreign policy upon domestic (U.S.) society and the growing involvement of the U.S. in international relations. Students are encouraged to understand fully and think critically about America's role in the world.
- HIST-410. American Constitutional History** **Credit 3(3-0)**
 Development of American constitutionalism from English origins to the present. Emphasis on the development of separation of powers, states' rights, the Supreme Court, and the sectional controversy, economic regulations, and the modernization of the Bill of Rights, especially problems of desegregation free speech, obscenity and criminal justice.
- HIST-412. Modernization in Africa from 1920 to the Present** **Credit 3(3-0)**
 The study of African development since World War I. Areas of study include: nationalism and independence movements, conflicts between traditional and modern ideas, United States and African relations, and racism in Southern Africa.
- HIST-416. History of Black Culture in the United States** **Credit 3(3-0)**
 Focus on early cultural developments, folk culture, and religion in antebellum America, social and cultural trends in the twentieth century, the "Harlem Renaissance," and urban life.
- HIST-420. Seminar: Urban America** **Credit 3(3-0)**
 Special topics in the rise of the American city and the development of urban patterns of life, concentration on such themes as population shifts to cities, the development of slums and ghettos, growth of municipal institutions and services, and the relationship of government with city residents. Prerequisites: HIST 205 and consent of the instructor.

HIST-430. Topics in Twentieth Century American History **Credit 3(3-0)**

In depth analysis of selected topics since the late nineteenth century, with special emphasis on written historical communication. Prerequisites: 6 hours of American history (204 and 205) and the consent of the instructor.

HIST-442. Russian and Soviet History **Credit 3(3-0)**

The history of Russia and the Soviet Union from the earliest times to the present, with emphasis on the twentieth century.

HIST-450. Modernization in Historical Perspective **Credit 3(3-0)**

This course concentrates on an analysis of the various paths to modernity taken by several advanced societies, notably the United States, England, France, Germany, Russia, and Japan. Particular attention will be devoted to the causes and effects of: industrialization, population growth, urbanization, social protest, changes in family structure, intellectual responses to rapid change, and the development of the modern state.

CUIN-536. Methods of Teaching Social Sciences **Credit 4(4-0)**

A study of techniques of social science instruction on the high school level. Required of those planning to teach the subject. Prerequisites: 27 semester hours of Social Studies and 15 semester hours of Education and Psychology.

Advanced Undergraduate and Graduate

HIST-600. The British Colonies and the American Revolution **Credit 3(3-0)**

The planting and maturation of the English colonies of North America. Relationships between Europeans, Indians, and transplanted Africans, constitutional development, religious ferment, and the colonial economy are studied.

HIST-603. Civil War and Reconstruction **Credit 3(3-0)**

Causes as well as constitutional and diplomatic aspects of the Civil War, the role of the Afro-American in slavery, in war, and in freedom, and the socio-economic and political aspects of Congressional Reconstruction and the emergence of the New South are studied.

HIST-605. Seminar on the Soviet Union **Credit 3(3-0)**

A seminar course on the Soviet Union including extensive reading and discussion and a major research paper.

HIST-606. U.S. History, 1900 - 1932 **Credit 3(3-0)**

Emphasizes political, economic, social, cultural and diplomatic developments from 1900 to 1932 with special attention to their effect upon the people of the United States and their influence on the changing role of the U.S. in world affairs.

HIST-607. U.S. Since 1932 - Present **Credit 3(3-0)**

With special emphasis on the Great Depression, New Deal, the Great Society, and the expanding role of the United States as a world power, World War II, Cold War, and Korean and Vietnam conflicts are studied. Major themes include the origin, consolidation, and expansion of the New Deal, the growth of executive power, the origins and spread of the Cold War, civil liberties, civil rights, and challenges for the extension of political and economic equality & the protection of the environment.

HIST-610. Seminar in the History of Twentieth Century Technology **Credit 3(3-0)**

A reading, research, and discussion course which investigates the development and, especially, the impact of major Twentieth century technologies. Attention will also be given to the process of invention, the relationship between science and technology, and the ethical problems associated with some contemporary technologies.

- HIST-615. Seminar in the History of Black America** **Credit 3(3-0)**
A reading, research, and discussion course which concentrates attention on various aspects of the life and history of Afro-Americans. Emphasis is placed on historiography and major themes which include nationalism, black leadership and ideologies, and economic development.
- HIST-616. Seminar in African History** **Credit 3(3-0)**
Research, writing and discussion on selected topics in African history.
- HIST-617. Readings in African History** **Credit 3(3-0)**
By arrangement with instructor.
- HIST-620. Seminar in Asian History** **Credit 3(3-0)**
Research, writing, and selected topics in Asian history.
- HIST-625. Seminar in Historiography and Historical Method** **Credit 3(3-0)**
The study of the writing of history as well as training in research methodology and communication, including basic computer and quantification skills.
- HIST-626. Revolutions in the Modern World** **Credit 3(3-0)**
A seminar course stressing comparative analysis of revolutions and revolutionary movements in the United States, France, Russia, China, Cuba, and Iran. Students will also evaluate theories of revolution in light of historical examples.
- HIST-630. Studies in European History, 1815-1914** **Credit 3(3-0)**
Intensive study of selected topics in Nineteenth Century European history.
- HIST-631. Studies in Twentieth Century Europe, 1914 - Present** **Credit 3(3-0)**
Intensive study of selected topics including World Wars I and II, the Russian Revolution, Hitler and the Holocaust, the Depression, the threat of nuclear war, the Welfare State, and the Solidarity movement in Poland.
- HIST-633. Independent Study in History** **Credit 3(3-0)**
By arrangement with instructor.
- POLI-645. American Foreign Policy—1945- Present*** **Credit 3(3-0)**
Examination of forces and policies that have emerged from Potsdam, Yalta, and World War II. Emphasis will be on understanding the policies that were formulated, why they were formulated, the consequences of their formulation, and the alternative policies that may have come about. Prerequisite: Survey course in American history, American Diplomatic history or consent of instructor.

Graduate

- HIST-701. Recent United States Diplomatic History** **Credit 3(3-0)**
Episodes in the history of American foreign relations that were especially important in influencing persistent patterns of this nation's role in international relations. Possible examples studied: Pearl Harbor, the Cold War, Korean War, Cuban missile crisis, Vietnam, nuclear arms limitation, and black Africa.
- HIST-712. The Black American in the Twentieth Century** **Credit 3(3-0)**
Research, reading, discussion, and an analysis of major facets of black life in the United States from 1900 to the present. Requires a major research paper.
- HIST-730. Seminar in History** **Credit 3(3-0)**
Topics to be selected by students and instructor. Includes a major research project.

POLI-730. Constitutional Development Since 1865* **Credit 3(3-0)**

Historical study of the development of the Constitution since 1865. Treatment will be given to important Constitutional decisions, major documents, major Supreme Court decisions, and public policy. Assignments in paperback books will be frequent.

HIST-740. History, Social Sciences, and Contemporary World Problems **Credit 3(3-0)**

Readings, discussions, and reports on the relationships between history and the social sciences as a whole, as well as their combined roles in dealing with contemporary world problems.

HIST-750. Thesis in History **Credit 3(3-0)**

Thesis work will be done with the appropriate instructor in accordance with field of interest.

CUIN-725. Problems and Trends in Teaching the Social Sciences **Credit 3(3-0)**

Current strategies, methods, and materials for teaching the social sciences. Emphasis on innovations, evaluation and relation to learning. Provision for clinical experiences.

*Political Science 645 and 730 are accepted for history credit.

PHILOSOPHY

PHIL-260. Introduction to Philosophy **Credit 3(3-0)**

An introductory course covering such topics as theories of reality, the nature in mind and knowledge, and the higher values of life.

PHIL-261. History of Philosophy **Credit 3(3-0)**

The history of philosophic thought is traced from ancient Greek philosophers to modern philosophers through Hegel.

PHIL-262. Logic **Credit 3(3-0)**

An introductory course designed to give a critical analysis of the principles, problems and fallacies in reasoning.

PHIL-308. Culture and Value **Credit 3(3-0)**

A critical study of the nature and justification of basic ethical concepts in light of historical thought.

PHIL-309. Contemporary Philosophy **Credit 3(3-0)**

A critical investigation of some contemporary movements in philosophy with special emphasis on existentialism, pragmatism, and positivism.

GEOGRAPHY

GEOG-200. Principles of Geography **Credit 3(3-0)**

A survey of the principles of geography.

GEOG-210. World Regional Geography **Credit 3(3-0)**

A survey of the geographic character of the major culture regions of the world. Contemporary cultural characteristics are examined within the framework of both environmental relationships and historical development.

GEOG-319. Regional Geography of the United States and Canada **Credit 3(3-0)**

A study of geographic regions of the United States and Canada.

GEOG-322. Economic Geography **Credit 3(3-0)**

A geographical survey of major economic activities: agriculture, forestry, fishing, mining, manufacturing, and commerce. Emphasis is placed upon areal patterns of production and exchange.

Undergraduate and Graduate

GEOG-640. Topics in Geography of the United States and Canada Credit 3(3-0)

Selected topics in cultural geography of the United States and Canada are studied intensively. Emphasis is placed upon individual reading and research and upon group discussion.

GEOG-641. Topics in World Geography Credit 3(3-0)

Selected topics in geography are studied intensively. Concern is for cultural characteristics and their interrelationships with each other and with habitat. Emphasis is upon reading, research, and discussion.

DIRECTORY OF FACULTY

Linda D. Addo, B.A., Bennett College; M.A., University of North Carolina at Chapel Hill; Ed.D., University of North Carolina at Greensboro, Associate Professor and Coordinator of Education Programs in the Department of History

Jacqueline Y. Blackmore, B.S., M.S., N. C. A&T State University; Assistant Professor

Andrew P. Boeger, B.A., Earlham College; M.A., Ph.D., University of Texas at Austin; Assistant Professor

Claude A. Clegg, B.S., University of North Carolina at Chapel Hill; M.A., University of Michigan at Ann Arbor; Instructor

Olen Cole, Jr., B.A., M.A., California State University at Fresno; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

Margaret L. Dwight, B.S., University of Southern Mississippi; M.A., Southern Illinois University; Ph.D., University of Missouri-Columbia; Assistant Professor

Francis O. Eguaroje, A.A., University of Ife; M.A., University of South Carolina; Ph.D., Ohio State University; Curator of the African Heritage Center

Fuabeh P. Fonge, B.A., The University of Yaounde; M.A., Georgetown University; Ph.D., Howard University; Assistant Professor

James L. Hevia, B.A., M.A., Pennsylvania State University; Ph.D., University of Chicago; Assistant Professor

Dorothy S. Mason, A.B., University of North Carolina at Greensboro; M.A., University of Georgia; Ph.D., University of North Carolina at Chapel Hill; Professor

Wayman B. McLaughlin, A.B., Virginia Union University; B.D., Andover Newton Theological School; Ph.D., Boston University; Professor

Peter V. Meyers, B.A., Wesleyan University; M.A., Ph.D., Rutgers University; Professor & Chairperson

Conchita F. Ndege, B.F.A., Xavier University; M.A., Ph.D., Howard University; Director of the African Heritage Center and Assistant Professor

Sandrea T. Williamson, B.A., Johnson C. Smith University, M.A. University of Illinois; Instructor

Department of Mathematics

Wilbur Smith
Chairperson

OBJECTIVES

The objectives of the Department of Mathematics are consistent with the purpose and philosophy of the University. The Department provides training in mathematical sciences that will help students served by it to deal with quantitative matters intelligently and effectively. In addition, the Department offers programs of study from which graduates can emerge with high degrees of mathematical skill and with sufficient training in related areas that they will be able to cope in diverse mathematical environments.

DEGREES OFFERED

- Engineering Mathematics—B.S.
- Mathematics—B.S.
- Mathematics, Secondary Education—B.S.
- *Applied Mathematics—M.S.
- *Mathematics, Secondary Education—M.S.

GENERAL PROGRAM REQUIREMENTS

Admission, retention and graduation requirements for students enrolled in degree programs in the Department of Mathematics are based upon the general admission, retention and graduation requirements of the University. However two units of algebra, one unit of plane geometry and one-half unit of trigonometry are required of all students who elect to pursue any curriculum offered in the department.

SPECIFIC PROGRAM REQUIREMENTS

Engineering Mathematics

The Engineering Mathematics major must complete a minimum of 124 semester hours of University courses, including 49 hours in mathematics and 22 hours in physics and engineering courses.

Mathematics

The Mathematics major must complete a minimum of 124 semester hours of University courses. These include 52 hours in mathematics or computer science courses.

Mathematics, Secondary Education

The Mathematics Education major must complete a minimum of 124 semester hours of University courses. These include 43 hours in mathematics, 3 of which must be in a course numbered higher than Mathematics 507, and 29 hours in education and/or psychology. Also, majors must earn a "C" or better grade in each mathematics course taken to fulfill the mathematics requirement. All Teacher Education admission, retention and graduation standards apply.

CAREER OPPORTUNITIES

The Bureau of Labor Statistics of the U.S. Department of Labor in its "Occupational Outlook for College Graduates" continues to report that the employment opportunities in education, cost analysis, government service and public health are expected to be good for graduates in mathematics.

CURRICULUM GUIDE FOR THE MAJOR IN ENGINEERING MATHEMATICS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	MATH 132	4
Elective (FOLA) ⁷	3	Elective (FOLA) ⁷	3
ENGL 100	3	ENGL 101	3
Social Science Elective ¹	3	Social Science Elective ¹	3
PHED 200 ⁶	2	SPCH 250	3
	<hr/> 15		<hr/> 16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 311	3
MATH 240 ⁸	3	MATH 331	3
PHYS 241, 251 (Lab)	4	PHYS 242, 252 (Lab)	4
Engineering Elective ³	3	Engineering Elective ³	3
Elective	2	Elective ²	3
	<hr/> 16		<hr/> 16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 332	3	MATH 350	3
Elective	3	MATH 224	3
Social Science Elective ¹	3	Social Science Elective ¹	3
Humanities Elective ²	3	Humanities Elective ²	3
Engineering Elective ³	3	Engineering Elective ³	3
	<hr/> 15		<hr/> 15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Advanced Math ⁵	3	Advanced Math ⁵	3
MATH 507	3	MATH Elective ⁴	3
MATH 440 or 460	3	MATH 505	1
MATH 608	3	Elective	9
Elective	3		<hr/> 16
	<hr/> 15		

Total Credit Hours: 124

¹ Four courses HIST 100, 101, 215, 216, 310, 311, 328, 412, 416; GEOG 200, 210; POLI 200, 220, 445; SOC 100, 200, 314.

² Three courses ENGL 200, 201, 202, 333, 433, 650, 652, 654, 656, 658, 660; MUSI 216, 217, 220, 221; ART 224, 225; SPCH 321, 351; PHIL 260, 262; FOLA 417, 618; THEA 630.

³ Must include a minimum of 12 credits taken in Physics or within one department of Engineering and approved by the Department of Mathematics.

⁴ MATH 508, 607, 608, 610, 611, 612, 620, 623, 631, 632, 633, 650, 651, 652, 665.

⁵ One sequence: Mathematics 623 and 624 or Mathematics 650 and 651.

⁶ May be replaced by any two credits in Physical Education.

⁷ FOLA 100, 101; or FOLA 102, 103; or FOLA 104, 105; or FOLA 106, 107.

⁸ May be replaced by COMP 165.

Note: Must include 3 hours Black Studies and 3 hours Global Studies.

CURRICULUM GUIDE FOR THE MAJOR IN MATHEMATICS (PROFESSIONAL)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	MATH 132	4
CHEM 106, 116	4	CHEM 107, 117	4
ENGL 100	3	ENGL 101	3
Social Science Elective ¹	3	Social Science Elective ¹	3
FRST 100	1	PHED 200	2
	<u>15</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 311	3
MATH 240 ²	3	MATH 331	3
PHYS 241, 251	4	PHYS 242, 252	4
Humanities Elective ²	3	Humanities Elective ³	3
SPCH 250	3	Elective	3
	<u>17</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 350	3	MATH 508	3
MATH 507	3	MATH Elective ⁵	3
MATH 224	3	MATH 440 or 460	3
Foreign Language ⁴	3	Foreign Language ⁴	3
Humanities Elective ³	3	Elective	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 511	3	MATH 512	3
MATH 505	1	MATH Elective ⁵	3
Social Science Elective ¹	3	Social Science Elective ¹	3
Math Elective ⁵	3	Electives	6
Electives	6		<u>15</u>
	<u>16</u>		

Total Credit Hours: 125

¹ Four courses required: HIST 100, 101, 215, 216, 310, 311, 328, 412, 416; GEOG 200, 210; POLI 200, 220, 445; SOCI 100, 200, 314.

² May be replaced by COMP 165.

³ Three courses required: ENGL 200, 201, 202, 333, 433, 650, 652, 654, 656, 658, 660; MUSI 216, 217, 220, 221; ART 224, 225; SPCH 321, 351; PHIL 260, 262; FOLA 417, 618; THEA 630.

⁴ A sequence of two courses in either French, German, or Russian.

⁵ 9 hours: MATH 332, 420, 423, 607, 608, 610, 611, 612, 620, 623, 624, 631, 632, 633, 650, 651, 652, 665.

Note: Must include 3 hours Black Studies and 3 hours Global Studies.

CURRICULUM GUIDE FOR THE MAJOR IN MATHEMATICS EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	MATH 132	4
ENGL 100	3	ENGL 101	3
FRST 100	1	Social Science Elective ⁵	3
Social Science Elective ⁵	3	Science Elective	4
Science Elective ¹	4	PHED Elective ²	1
PHED Elective ²	1		15
	<u>16</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 240	3
Humanities Elective (Black Studies) ⁷	3	CUIN 301	2
CUIN 300	2	SPCH 250	3
Humanities Elective ⁶	3	Humanities Elective ⁶	3
PHED 200	2	MATH 311	3
MATH 224	3	Elective	3
	<u>17</u>		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 350	3	MATH 242	3
CUIN 400	3	CUIN 436	3
PSYC 320	3	Elective (MATH) ⁴	6
MATH 507 or 511	3	Elective (FOLA) ³	3
Elective (FOLA) ³	3	Elective	3
	<u>15</u>		18

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 507 or 511	3	CUIN 624	3
MATH 505	1	CUIN 500	3
CUIN 529	3	CUIN 560	6
Electives	4		12
MATH 420 (History of Math)	3		
	<u>14</u>		

Total Credit Hours: 124

¹ 8 hrs. - PHYS 225, 235 and either PHYS 226, 236 or CHEM 101, 111 or BIOL 100 or CHEM 100.

² 2 hrs. - PHED 101, 103, 104, 107, 108, 109, 110, 111, 112, 229, 231, 233, 234, 235, 237, 238, 246, 247, 249, 251, 261, 263, 343, 344, 354, 361.

³ 6 hrs. - FOLA 100, 101 or FOLA 102, 103 or FOLA 104, 105.

⁴ 6 hrs. - MATH 223, 331, 332, 423, 440 or 460, 508, 512, 604, 607, 608, 610, 611, 612, 620, 623, 624, 631, 632, 633, 651, 652, 665; COMP 160, 165, 280, 285.

⁵ 6 hrs. - HIST 100, 101 or HIST 204, 205.

⁶ 6 hrs. - ENGL 200, 201 or ENGL 203, ENGL 210.

⁷ 3 hrs. - ENGL 433, 650, 652, 654, 656, 658, 660; FOLA 417, 618; MUSI 220, 221; THEA 630.

COURSES WITH DESCRIPTIONS FOR MATHEMATICS

MATH-100. Intermediate Mathematics

Credit 3(3-0)

Elementary properties of real numbers and basic algebra through solving of quadratic equations by various means. Required of students whose mathematics SAT scores are low and whose major curriculum includes either MATH 101 or MATH 111.

MATH-101. Fundamentals of Algebra and Trigonometry I*

Credit 3(3-0)

Numbers and their properties polynomials, rational expressions, rational exponents, radicals, equations and inequalities in one variable, relations and functions. Prerequisite: A satisfactory score on the mathematics portion of the Scholastic Aptitude Test or MATH 100.

MATH-102. Fundamentals of Algebra and Trigonometry II

Credit 3(3-0)

A continuation of MATH 101. Quadratic functions, systems of linear equations, exponential and logarithmic functions, circular functions, trigonometric functions, analytical trigonometry and the binomial theorem. Prerequisite: MATH 101.

MATH-110. Pre-Calculus for Engineers and Scientists

Credit 4(4-2)

Algebraic properties of the number system, fundamental operations, exponents and radicals, functions and graphs, solutions of equations and systems of equations, trigonometric functions and identities, inequalities, logarithms, progressions, mathematical induction, binomial theorem, permutations and combinations. Prerequisite: One unit of high school algebra and one unit of high school geometry.

MATH-111. College Algebra and Trigonometry*

Credit 4(4-0)

Review of basic algebra; first and second degree equations; polynomial and rational functions-systems of equations-inequalities, right triangle trigonometry; and trigonometric identities and equations. Prerequisites: Mathematics 100 or two units of high school algebra, one unit of high school geometry and a satisfactory score on the mathematical portion of the Scholastic Aptitude Test.

MATH-112. Calculus for Non-Mathematics Majors

Credit 4(4-0)

A brief treatment of basic concepts of differential and integral calculus with applications to business, economics, social and behavioral sciences; polynomial, rational, exponential and logarithmic functions. Prerequisite: MATH 102, 110, or 111.

MATH-115. Mathematics of Business and Finance

Credit 3(3-0)

A brief review of computing with whole numbers, decimals, fractions, per cent, problem solving and the metric system. Simple interest, discount, partial payments, payroll wages and commission accounts, discounts and mark-ups, retailing, taxes, distribution of ownership, transactions in corporate securities, insurance, compound interest, annuities amortization and sinking funds. Prerequisite: MATH 101, 110, or 111.

MATH-123. Discrete Mathematics I

Credit 3(3-0)

An introduction to applied discrete mathematics. Topics include set theory, introduction to logic, functions, recursion, relations, properties of integers, and elementary matrix algebra. Prerequisite: MATH 110 or equivalent.

MATH-131. Calculus I

Credit 4(4-0)

Limits and continuity of functions, the derivative, applications of the derivative, the definite integral and applications of the definite integral. Prerequisite: MATH 110 or appropriate approval.

MATH-132. Calculus II

Credit 4(4-0)

Topics in analytic geometry, differentiation and integration of exponential, logarithmic, trigonometric, inverse trigonometric and hyperbolic functions, additional techniques and

applications of integration, indeterminate forms, improper integrals, Taylor's Formula and infinite series. Prerequisite: MATH 131.

MATH-223. Discrete Mathematics II

Credit 3(3-0)

This course is a continuation of MATH 123. Topics include Boolean algebra and applications elementary graph theory, trees and applications, and mathematical techniques for algorithm analysis. Prerequisite: MATH 123 or 311.

MATH-224. Introduction to Probability and Statistics

Credit 3(3-0)

A general course-covering fundamentals of statistics, central tendencies, variabilities, graphic methods, frequency distributions, correlations, reliability of measures, theory and methods of sampling and descriptive and analytical measures of statistics Prerequisite: MATH 111.

MATH-231. Calculus III

Credit 4(4-0)

This course will cover plane curves and polar coordinates, vector and solid geometry, vector valued functions, partial differentiation, multiple integrals, applications of multiple integrals and vector analysis. Prerequisite: MATH 132.

MATH-240. Introduction to the Programming of Digital Computers

Credit 3(3-0)

This course teaches students problem-solving techniques and how to program in the FORTRAN language. Students are exposed to a variety of mathematical computer software, including Maple. Using the graphics calculator as a programming tool will be explored. Prerequisite: MATH 102, 110 or 111.

MATH-242. College Geometry

Credit 3(3-0)

Postulational systems, Euclid's Parallel Postulate, a brief study of non-Euclidean geometries, Euclidean geometry as a special case of other geometrics and defects of Euclid's system. Prerequisite: MATH 132.

MATH-311. Mathematical Logic and Proof Techniques

Credit 3(3-0)

Emphasis on development or writing skills and the ability to understand and develop proofs and logical arguments. Topics include quantifiers, rules of logic, and methods of mathematical proof, with applications to sets, integers, real numbers, functions, relations, and combinatorics. Prerequisite: MATH 132.

MATH-331. Introduction to Differential Equations

Credit 3(3-0)

This course will cover first order differential equations, higher order linear differential equations, matrices and determinants, systems of linear algebraic equations, systems of linear differential equations, and Laplace transforms. Prerequisite: MATH 132.

MATH-332. Introduction to Applied Mathematics

Credit 3(3-0)

This course will cover Fourier series, partial differential equations, complex variables, Taylor and Laurent series and residue theory. Prerequisite: MATH 331.

MATH-350. Linear Algebra and Matrix Theory I

Credit 3(3-0)

An introduction to linear algebra and matrix theory; the algebra of matrices and its application to the solutions of systems of linear equations, determinants, real and complex vector spaces, bases, dimension, linear transformations, eigenvalues and eigenvectors. Prerequisite: MATH 132.

MATH-397. Co-Operative Industrial Experience I

Variable: 1-4

A supervised learning experience in a specified private or governmental facility. The student must be in industry full time for at least one summer or one semester and must perform supervised work that will enhance his/her educational background in an area related to mathematics and/or computer science. In addition to the supervisor's evaluation on the field, the student's performance will be evaluated by a departmental faculty committee, based upon

reports, informal portfolios and forum and/or a seminar presented by the student upon his/her return to the university.

MATH-398. Co-Operative Industrial Experience II

Variable: 1-4

The description of this course is the same as MATH-397 and is normally the second Co-op experience of the student related to mathematics and/or computer science. The maximum number of credit hours that may be earned by a student in the two courses MATH-397 and MATH-398 is six.

MATH-420. History of Mathematics

Credit 3(3-0)

A survey of the development of mathematics by chronological periods with biographical references, illustrations of national and racial achievements and discussion of the evaluation of certain important topics of elementary mathematics. Prerequisite: MATH 231.

MATH-423. Theory of Equations

Credit 3(3-0)

Methods of solving cubics, quartics and other algebraic equations; methods of approximating roots-systems of equations and, elements of determinants and matrices. Prerequisite: MATH 132.

MATH-440. Numerical Methods

Credit 3(2-2)

Numerical methods as related to programming techniques, interpolation, extrapolation, approximate solutions of algebraic and transcendental equations, simultaneous linear equations, initial-value, characteristic-value and boundary-value problems, partial differential equations of the hyperbolic parabolic and elliptic types. Corequisite: MATH 240

MATH-460. Numerical Analysis

Credit 3(3-0)

An introduction to principles and techniques of numerical mathematics. Topics in round-off error analysis, the approximation of functions, derivatives and integrals, and the numerical solutions of non-linear equations, ordinary differential equations and the systems of linear equations. Prerequisites: MATH 231, 240 and 350.

MATH-505. Seminar in Mathematics

Credit 1(1-0)

Methods of preparing and presenting seminars, presentation of seminars in current developments in mathematics and/or topics of interest which are not included in formal courses. Required for mathematics majors. Prerequisite: MATH 507 or 511.

MATH-507. Intermediate Analysis I

Credit 3(3-0)

A rigorous treatment of the fundamental principles of analysis, limits, continuity, sequences, series, differentiability and integrability and functions of several variables. Prerequisites: MATH 231 and 311 or consent of instructor.

MATH-508. Intermediate Analysis II

Credit 3(3-0)

A continuation of MATH 507. Prerequisite: MATH 507.

MATH-511. Abstract Algebra I

Credit 3(3-0)

Elementary properties of integers, rings, integral domains, and fields, properties of groups, including abelian groups, permutations, homomorphisms, normal subgroups, and factor groups. Prerequisite: MATH 231, 311 or consent of instructor.

MATH-512. Abstract Algebra II

Credit 3(3-0)

A continuation of MATH 511 including topics in commutative ring theory, Galois field theory and module theory. Prerequisite: MATH 511.

MATH-550. Vector Analysis

Credit 3(3-0)

Vector and tensor calculus, covariant and contravariant components; integral theorems; applications to geometry, mechanics and electromagnetic theory. Prerequisite: MATH 331.

Advanced Undergraduate and Graduate

MATH-600. Introduction to Modern Mathematics for Secondary

School Teachers

Credit 3(3-0)

Elementary theory of sets, elementary logic and propositional systems, nature and methods of mathematical proofs, structure of the real number system. Evaluation of instructional software. Use of computer integrated instruction to teach pertinent concepts in secondary school mathematics. Prerequisite: Consent of the instructor.

MATH-601. Algebraic Equations for Secondary School Teachers

Credit 3(3-0)

Algebra of sets, algebraic equations, systems of equations, matrices and determinants with applications, and the elements of vector spaces. Prerequisite: MATH 600 or consent of the Department of Mathematics and Computer Science.

MATH-602. Modern Algebra for Secondary School Teachers

Credit 3(3-0)

Sets and mappings, properties of binary operations, groups, rings, integral domains, vector spaces and fields. Prerequisite: MATH 600 or consent of the Department of Mathematics and Computer Science.

MATH-603. Introduction to Real Analysis

Credit 3(3-0)

The following topics will be covered in this course: elementary set theory, functions, axiomatic development of the real numbers, metric spaces, convergent sequences, completeness, compactness, connectedness, continuity, limits, sequences of functions, differentiation, the mean value theorem, Taylor's theorem, Riemann integration, infinite series, the fixed point theorem, partial differentiation, and the implicit function theorem. Prerequisite: MATH 311 or consent of the instructor.

MATH-604. Modern Geometry for Secondary School Teachers

Credit 3(3-0)

Re-examination of Euclidean geometry, axiomatic systems and the Hilbert axioms, introduction to projective geometry and other non-Euclidean geometries. Prerequisite: MATH 600 or consent of the Department of Mathematics and Computer Science.

MATH-606. Mathematics for Chemists

Credit 3(3-0)

Review of those principles of mathematics which are involved in chemical computations and derivations from general chemistry through physical chemistry; topics covered include significant figures, methods of expressing large and small numbers, algebraic operations, trigonometric functions and an introduction to calculus.

MATH-607. Theory of Numbers

Credit 3(3-0)

Divisibility properties of the integers, the Euclidean algorithm, congruences, diophantine equations, number-theoretic functions and continued fractions. Prerequisite: Twenty hours of college mathematics.

MATH-608. Methods of Applied Statistics

Credit 3(3-0)

This course introduces the SAS programming language, and uses it in the analysis of variance, both single and multifactor. It includes various methods of hypothesis testing and constructing confidence intervals. The course covers simple and multiple linear regression, including model building and variable selection techniques. Elements of time series and categorical data analysis are covered. Prerequisite: MATH 224.

MATH-610. Complex Variables I

Credit 3(3-0)

The following topics will be covered in this course: complex number system, limits of complex sequences, complex functions, continuity, limits of functions, derivatives, elementary functions, Cauchy-Riemann equations, antiderivatives harmonic functions, inverse functions, power series, analytic functions, analytic continuation, contour integrals, Cauchy's theorem and Cauchy's integral formula. Prerequisite: MATH 231.

MATH-611. Complex Variables II**Credit 3(3-0)**

Mathematics 611 is a continuation of Mathematics 610. The following topics will be covered in this course: Liouville's theorem, the fundamental theorem of algebra, the winding number, generalized Cauchy theorems, singularities, residue calculus, Laurent series, boundary value problems, harmonic functions, conformal mappings, Poisson's formula, potential theory, physical applications and the Riemann mapping theorem. Prerequisite: MATH 610.

MATH-612. Advanced Linear Algebra (formerly MATH 520)**Credit 3(3-0)**

This course covers vector spaces, linear transformations and matrices determinants and systems of linear equations, eigenvalues and eigenvectors, diagonalization, inner products, bilinear quadratic forms, canonical forms, and application to engineering, and applied sciences. Prerequisite: MATH 350 or consent of the instructor.

MATH-620. Elements of Set Theory and Topology**Credit 3(3-0)**

Operations on sets, indexed families of sets, products of sets, relations, functions, metric spaces, general topological spaces, continuity, compactness and connectedness. Prerequisites: MATH 231 and consent of the instructor.

MATH-623. Probability Theory and Applications**Credit 3(3-0)**

This course begins with an introduction to sample spaces and probability, including combinatorics. It covers continuous and discrete random variables, including multi-variate random variables and expectations; also marginal and conditional distributions are derived. The course introduces moment generating functions, and covers the central limit theorem and its applications. Prerequisite: MATH 231.

MATH-624. Theory and Methods of Statistics**Credit 3(3-0)**

This course introduces methods of statistical estimation and inference including the following topics: sufficient statistics, confidence sets, hypothesis tests, and maximum likelihood methods. The theory of uniformly most powerful tests and the Neyman-Pearson Lemma are covered. Other topics include least squares estimation, the linear model, and Bayesian methods. Prerequisite: MATH 623.

MATH-625. Mathematics for Elementary Teachers, K-8, I**Credit 3(3-0)**

Designed for in-service and prospective teachers who have as their goal "to teach the basic skills and competencies of mathematics sought in today's world." The course emphasizes that the teacher first, must have the knowledge and skills in order to accomplish this goal. It stresses fundamentals of arithmetic, sets and operations, number systems, fractions, decimals, percents, estimation, consumer arithmetic, problem solving and traditional and metric geometry and measurement. This course may not be used for degree credit.

MATH-626. Mathematics for Elementary Teachers, K-8, II**(Formerly 3686)****Credit 3(3-0)**

A continuation of MATH 625. No credit towards a degree in mathematics; not open to secondary school teachers of mathematics. Credit on elementary education degree. Prerequisite: MATH 625.

MATH-631. Linear and Non-Linear Programming**Credit 3(3-0)**

Optimization subject to linear constraints; transportation problems, SIMPLEX algorithm; network flows; application of linear programming to industrial problems and economic theories; introduction to non-linear programming. Prerequisites: MATH 350 and on high level programming language.

MATH-632. Games and Queue Theory**Credit 3(3-0)**

General introduction to game theory; two-person-non-zero-sum-non-cooperative games; two-person cooperative games; reasonable outcomes and values; the minimax theorem. Introduction to queuing theory; single server queuing processes; many serve queuing processes;

applications to economics and business. Prerequisite: MATH 224, MATH 350, or consent of the instructor.

MATH-633. Stochastic Processes

Credit 3(3-0)

This course begins with a review of Probability and Random Variables. Markov Processes, Poisson Processes, Waiting Times, Renewal Phenomena, Branching Processes, Queuing System, Service Times are covered. Prerequisite: MATH 623 or consent of the instructor.

MATH-650. Ordinary Differential Equations

Credit 3(3-0)

This is an intermediate course in ordinary differential equations with emphasis on applications. Topics include linear systems and various phase plane techniques for non-linear ordinary differential equations. Prerequisite: MATH 331.

MATH-651. Partial Differential Equations

Credit 3(3-0)

This course includes introduction to complex variables and residue calculus, transform calculus, higher order partial differential equations governing various physical phenomena, non-homogeneous boundary value problems, orthogonal expressions, Green's functions and variational principles. Prerequisites: MATH 331 and 332.

MATH-652. Methods of Applied Mathematics II

Credit 3(3-0)

An introduction to integral equations and conversion of differential problems into integral equations of Volterra and Fredholm types, solution by iteration and other methods, existence theory, eigenvalue problems, Hilbert-Schmidt theory of symmetric kernels and topics in the calculus of variation, including optimization of integrals involving functions of more than one variable, Hamilton's principles, Strum-Liouville theory, Rayleigh-Ritz methods, etc. Prerequisites: MATH 331 and 332.

MATH 665. Principles of Optimization

Credit 3(3-0)

Algebra, linear inequalities, duality, graph, transport network; linear programming; special algorithms; selected applications. An upper level course. Prerequisites: MATH 231 or equivalent and MATH 240 and 350.

MATH 675. Graph Theory

Credit 3(3-0)

Varieties of graphs, graph theory algorithms, and applications of graph theory to other disciplines. Prerequisite: MATH 350.

MATH 691. Special Topics in Applied Mathematics

Credit 3(3-0)

Topics are selected from differential equations, numerical methods, operations research, applied mechanics and from other fields of applied mathematics. Prerequisite: Senior or graduate standing and consent of the instructor.

*Students are required to purchase supplemental materials for this course. General Education course.

DIRECTORY OF FACULTY

Bolindra N. Borah, B.S., Gauhat University, India; M.S., Ph.D., Oregon State University; Professor

Wilbur L. Smith, B.S., North Carolina A&T State University, M.S., Ph.D., The Pennsylvania State University; Professor and Chairperson

Gilbert Casterlow, Jr., B.S., M.S., North Carolina A&T State University; Ph.D., The Pennsylvania State University; Professor

James F. Chew, B.S., M.S., Ph.D., Virginia Polytechnic Institute; Associate Professor

Joseph R. Gruendler, B.S., M.S., Ph.D., University of Wisconsin; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

Thomas G. Clarke, B.A., Hiram College, M.S., Purdue University; Ph.D., Kent State University; Assistant Professor

Janis M. Oldham, B.A., University of Chicago; M.S., Purdue University; Ph.D., University of California-Berkeley; Assistant Professor

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Robert C. Mers, A.B., University of Texas; M.S., University of Illinois; Ph.D., University of Colorado; Associate Professor

Marcus Lamberth, B.S., M.S., North Carolina A&T State University; M.S., University of Illinois; Instructor

Gloria J. Phoenix, B.S., Virginia Union University; M.S., University of North Carolina at Chapel Hill, Lecturer

Patricia G. Shelton, B.S., M.S., North Carolina A&T State University; Lecturer

Nathan F. Simms, Jr., B.S., M.S., North Carolina Central University; Ph.D., Lehigh University; Professor.

Mingxiang Chen, B.S., M.S., Huazhong Normal University, Ph.D., Georgia Institute of Technology; Assistant Professor

Abdulcadir Issa, B.S., Afogoye University; M.S., Ph.D., Howard University; Assistant Professor

Alexandra Kurepa, B.S., M.S., University of Zagreb, Ph.D., University of Northern Texas; Assistant Professor

Guoging Tang, B.S., Anhui University; M.S., Nanjing University of Science and Technology, Ph.D., Rutgers University; Assistant Professor

Paramanathan Varatharajah, B.S., University of Jaffna; M.S., Ph.D., University of Arizona; Assistant Professor

Department of Music

Clifford Edward Watkins, I
Chairperson

OBJECTIVES

The general objectives of the department of music are: (1) to enhance the cultural and aesthetic life of the university student through personal experiences in a well directed program of education in music; (2) to provide the student with basic skills, techniques, pedagogical concepts, and perspective for a career as an artist and as a teacher of music on the elementary and secondary school levels; and (3) to interpret, create, and maintain the highest level in individual and group performance in music.

DEGREES OFFERED

Bachelor of Science in Music Education with Choral or Instrumental Concentration

Bachelor of Arts—Performance

Bachelor of Arts—General Music

The Department of Music offers two major degree programs. One of these is a liberal arts curriculum leading to the Bachelor of Arts in Music degree with concentrations in General Music or performance. This degree program is designed to accommodate students who wish to enter some area of music other than teaching. The other degree program is a teacher-

education based curriculum leading to the Bachelor of Science in Music Education degree with either a choral or instrumental concentration. Students intending to teach in the public schools are strongly urged to follow this curriculum in order that they may meet certification requirements. The requirements for each degree program may differ and are not necessarily interchangeable. Students are advised to check programs carefully.

CAREER OPPORTUNITIES

Successful completion of the requirements of the B.A. degree in Music or the B.S. degree in Music Education provides the students with possible career opportunities for public school music teaching, as well as for various careers in the performing arts, and/or related disciplines.

ACADEMIC COUNSELING

Each student is assigned to a music faculty member for counseling in matters of curriculum and related or personal problems as are appropriate. Students should consult regularly with the advisors to gain the benefits from their experience and expertise.

ADMISSION—RETENTION—EVALUATION

The admission of students to the undergraduate degree programs in the Department of Music is based upon the general admission requirements of the University.

For certified admission to the study of music as a major or minor, the prospective music student must stand in a satisfactory manner. Auditions set by the faculty panel in the principal applied music area.

1. To continue in the department of music as a major, students must maintain a "C", (2.0) average in all music courses. Students whose average fall below 2.0 will be placed on departmental probation for the following semester of enrollment. Should the average not meet the minimum requirements at the end of the probationary period, their status will be subject to review by the departmental Committee on Curriculum, Standards and Measures. Students who earn a semester grade of "D" or below, must repeat the affected course(s) and earn a grade of "C" or better before enrolling into any continuation or the next level of said course(s). Student progress will be evaluated at the end of the fourth semester of residency to determine approval for enrollment into upper level (junior classification, 400-600) music courses.

Seniors are encouraged to take the Undergraduate Record, the Graduate Record and the National Teacher Examinations to build a data base for evaluation of the music program. Upon entrance into the music education program, each student must choose either an instrumental or a choral concentration. Those whose principal applied music subject is either voice or piano should select the choral concentration, and those whose principal applied subject is an orchestral instrument should select the instrumental concentration. A student is not fully admitted to the teacher education program, however, until the end of the sophomore year. At this time his/her academic work and general prospects as a teacher are examined by his/her department and the Teacher-Education Council. This is accomplished in part through special inventories and tests of achievement. Upon acceptance, the student is permitted to enroll in upper level professional education courses. Admission to the teacher-education program of the university is regulated by the School of Education. At the end of the four years, the student is again evaluated by his/her department and the Teacher Education Council to determine whether he/she has developed the competencies required of a teacher in his/her discipline. If the student is able to satisfy all exit criteria, he is then

recommended for a teaching certificate. More detailed information concerning entrance and exit requirements and procedures for the teacher-education program is available from the academic advisor. It is presumed that students enrolled in any part of the music programs are willing to be governed by the rule, requirements and directives associated with those programs. The faculty and administration reserves the right to terminate the tenure of those who demonstrate an unwillingness to conform to these standards.

PERFORMANCE ENSEMBLES

Each student with a major in music is required to maintain continuous membership in a departmentally sanctioned performance Ensemble. Participation in more than a single ensemble is possible and encouraged so long as there are no schedule conflicts or violations of University policy concerning student course load. "All ensembles must have four or more members."

RECITAL SEMINAR

Music 307 is required each semester of enrollment as a major in the department. Also attendance is required, for all music majors and minors, at student or faculty recitals, band, choir, and chamber ensemble concerts, and Iyceum programs that involve musical performance. A systematic method of checking and recording attendance will be used.

INSTRUMENTS AND PRACTICE FACILITIES

Several studios are provided as practice facilities for students. Each contains a piano which is tuned regularly and kept in good repair.

With the exception of piano students, each music major/minor is required to furnish an instrument for his personal use. University owned instruments are primarily for the use of non-major students who serve in the instrumental ensembles to complete the necessary instrumentation as need dictates. In as great a quantity as is possible, University-owned instruments will be provided for the instruction of music majors and minors in music education classes.

DEPARTMENTAL REQUIREMENTS FOR THE DEGREE:

Bachelor of Science in Music Education

Instrumental Concentration

- I. Applied Music—21 Semester Hours 113, 213, 413, 114, 214, 503, 513, 550 or equivalent
- II. Music Theory—21 Semester Hours 101, 102, 200, 201, 400, 402, 501
- III. Music History and Literature—6 Semester Hours 403, 404
- IV. Music Education—8 Semester Hours 105, 424, 425, 426, 427
- V. Music Performance—14 Semester Hours One ensemble required each semester, elect from 300, 301, or 309, and add 307 each semester.
- VI. Professional Education—27 Semester Hours Education 300, 301, 400, 436, 500, 530, 532, 560, 624

TOTAL HOURS REQUIRED: 97 Semester Hours

Choral Concentration

- I. Applied Music—23 Semester Hours 100 or 560, 113, 213, 413, 503, 513, 550, 114, 214 or equivalent II. Music Theory—21 Semester Hours 101, 102, 200, 201, 400, 402, 501
- II. Music Theory—21 Semester Hours 101, 102, 200, 201, 400, 402, 501
- III. Music History and Literature—6 Semester Hours 403, 404
- IV. Music Education—7 Semester Hours 105, 424, 425, 426
- V. Music Performance—14 Semester Hours One ensemble required each semester, elect from 300, 301 or 309, and add 307 each semester.
- VI. Professional Education—27 Semester Hours Education 300, 301, 400, 436, 500, 530, 531, 560, 624

TOTAL HOURS REQUIRED: 97 Semester Hours

GENERAL EDUCATION REQUIREMENTS FOR B.S. IN MUSIC EDUCATION

English Composition (2 courses required)

Eng 100	3(3-0)
Eng 101	3(3-0)

Natural and Physical Science (4 courses required)

Biol 100	4(3-2)
Phys 110 (Musi 415)	2(2-0)
Math 101	3(3-0)
Math 102	3(3-0)

Foreign Language (1 course required) intermediate or advanced levels

French, German, or Spanish I	3(3-0)
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Social and Behavioral Sciences (3 courses required)

Hist 100	3(3-0)
Hist 101	3(3-0)
Psy 320	3(3-0)

Humanities (3 courses required*)

Speech 250	3(3-0)
*Mus 403 and 404 complete the Humanities requirement	

Health and Physical Education

Phy Ed 200	2(2-0)
Phy Ed 101	1(0-2)

CURRICULUM GUIDE FOR THE BACHELOR OF SCIENCE DEGREE IN MUSIC EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
*MUSI 100 or 119 or 260	1	MUSI 102	3
MUSI 101	3	MUSI 113, 123, 133, 143, 153 or 163	2
MUSI 113, 123, 133, 143, 153 or 163	2	MUSI 114, 124, 134, 144, 154 or 164	1
MUSI 114, 124, 134, 144, 154 or 164	1	MUSI 300, 301, or 309	2
MUSI 300, 301, or 309	2	MUSI 307	0
MUSI 307	0	ENGL 101	3
ENGL 100	3	HIST 101	<u>3</u>
HIST 100	3	MATH 102	<u>3</u>
MATH 101	<u>3</u>		17
	18		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 200	3	MUSI 201	3
MUSI 213, 223, 233, 243, 253 or 263	2	MUSI 213, 223, 233, 243, 253 or 263	2
MUSI 214, 224, 234, 244, 254 or 264	1	MUSI 214, 224, 234, 244, 254 or 264	1
MUSI 300, 301 or 309	2	MUSI 300, 301 or 309	2
MUSI 307	0	MUSI 307	0
FOLA (INT or ADV) 300	3	BIOL 100	4
PHED 200	2	CUIN 300	2
PSYC 320	3	SPCH 250	<u>3</u>
PHED 101	<u>1</u>		17
	17		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 105	1	MUSI 402	3
MUSI 400	3	MUSI 402	3
MUSI 403	3	MUSI 413, 423, 433, 443, 453	2
MUSI 413, 423, 433, 443, 453		or 463	
or 463	2	MUSI 300, 301 or 309	2
MUSI 300, 301, or 309	2	MUSI 307	0
MUSI 307	0	CUIN 436	3
MUSI 424	2	CUIN 530	2
MUSI 427			<u>15</u>
MUSI 415	2		
CUIN 301	2		
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 300, 301 or 309	2	CUIN 500	3
MUSI 307	0	CUIN 560	6
MUSI 501	2	CUIN 624	3
MUSI 503	2		<u>12</u>
MUS 593	2		
CUIN 400	3		
CUIN 531 or 532	3		
	<u>14</u>		

Total Credit Hours: 127

** Voice concentrators will enroll in MUSI 100 Diction*

Instrumental concentrators will enroll in MUSI 119 Sightsinging

Piano concentrators will enroll in MUSI 260 Accompanying (based on exhibited skills, the Piano teacher may delay enrollment in this course until later semesters)

DEPARTMENTAL REQUIREMENTS FOR THE DEGREE BACHELOR OF ARTS IN MUSIC

Performance Concentration

- I. Applied Music—24 Semester Hours 113, 213, 413, 513, 114, 214, 503, 550. Voice students add 100. Piano students add 560.
- II. Music Theory—21 Semester Hours 101, 102, 200, 201, 400, 402, 501
- III. Music History and Literature—10 Semester Hours 403, 404, Wind and Percussion students add 408 and 412. Piano students add 409 and 411. Voice students add 410 and 411.
- IV. Music Performance—18 Semester Hours 307 and either 300 or 301 or 309 (eight semesters); and either 302, 303, 304, 305, 306, or 308 (two semesters) in senior year.
- V. Other Music Courses—3 Semester Hours Music 618
- VI. Related Courses—3 Semester Hours Philosophy 260

TOTAL HOURS REQUIRED: 79

GENERAL EDUCATION REQUIREMENTS FOR B.A. IN MUSIC

NOTE: The general education requirements are the same as for the B.S. in Music Education requirements with the following exceptions:

- | | |
|---------------------|--------|
| 1) Add: PHIL 260 | 3(3-0) |
| 2) Delete: PHED 101 | 1(0-2) |
| SPCH 250 | 3(3-0) |

CURRICULUM GUIDE FOR THE DEGREE: BACHELOR OF ARTS (PERFORMANCE)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 101	3	MUSI 102	3
MUSI 113, 123, 133, 143, 153 or 163	2	MUSI 113, 123, 133, 143, 153 or 163	2
MUSI 134, 144, 154 or 164	1	MUSI 134, 144, 154 or 164	1
MUSI 300, 301 or 309	2	MUSI 300, 301 or 309	2
MUSI 307	0	MUSI 307	0
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
MUSI 100 or 119 or 260	1	PHED 200	2
	<u>15</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 200	3	MUSI 201	3
MUSI 213, 223, 233, 243, 253 or 263	2	MUSI 213, 223, 233, 243, 253 or 263	2
MUSI 234, 244, 254 or 264	1	MUSI 234, 244, 254 or 264	1
MUSI 300, 301 or 309	2	MUSI 300, 301 or 309	2
MUSI 307	0	MUSI 307	0
FOLA I	3	FOLA II	3
MATH 101	3	MATH 102	3
ENGL 200 (or Humanities elective)	3	ENGL 201 (or Humanities elective)	3
	<u>17</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 400	3	MUSI 402	3
MUSI 413, 423, 433, 443, 453 or 463	2	MUSI 413, 423, 433, 443, 453 or 463	2
MUSI 300, 301 or 309	2	MUSI 300, 301 or 309	2
MUSI 307	0	MUSI 404	3
MUSI 403	3	MUSI 307	0
PHYS 110 or MUSI 415	3	Free Elective	2
MUSI 560	2	BIOL 100	4
Free Elective	2		<u>16</u>
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 300, 301 or 309	2	MUSI 300, 301 or 309	2
MUSI 302, 303, 304, 305 or 308	1	MUSI 302, 303, 304, 305 or 308	1
MUSI 307	0	MUSI 307	0
MUSI 408 or MUSI 410	2	MUSI 411 or 412 or 409	2
MUSI 501	2	MUSI 503	2
MUSI 513, 523, 533, 543, 553 or 563	2	MUSI 593	2
PSYC 320	3	MUSI 618	3
	<u>12</u>	PHIL 260	<u>3</u>
			15

Total Hours: 125 hrs. General Education: 48 hrs. Music Hours: 78 hrs.

DEPARTMENTAL REQUIREMENTS FOR THE DEGREE BACHELOR OF ARTS IN GENERAL MUSIC

- I. Musical Performance and Electives—27 Semester Hours
 - Applied Music—113, 213, 114, 214 (or equivalent)
 - Ensemble—Music 300, 301 or 309 and Music 302, 303, 304, 305, 306 or 308
 - Research—Music 551
- II. Musicianship—26 Semester Hours Music 101, 102, 200, 201, 400, 402, 501, 403 and 404
- III. General Studies—75 Semester Hours

CURRICULUM GUIDE FOR THE MAJOR IN GENERAL MUSIC

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 101	3	MUSI II 102	3
MUSI 113 123, 133, 143, 153 or 163	2	MUSI 113, 123, 133, 143, 153, 163	2
MUSI 164	1	MUSI 164	1
MUSI 307	0	MUSI 307	0
MUSI	2	MUSI	2
ENGL 100	3	ENGL 101	3
HIST 100	3	HIST 101	3
MATH 101	<u>3</u>	MATH 102	<u>3</u>
	17		17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 200	3	MUSI 201	3
MUSI 213, 223, 233, 243, 253 or 263	2	MUSI 213, 223, 243, 253 or 263	2
MUSI 264	1	MUSI 264	1
MUSI 307	0	MUSI 307	0
MUSI	2	MUSI	2
ENGL 200 or Humanities elective	3	ENGL 201 or Humanities elective	3
MUSI 216	3	MUSI 220	3
PHED 200	2	SPCH 250	3
	<u>16</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI 400	3	MUSI 402	3
MUSI 403	3	MUSI 404	3
MUSI	1	MUSI	1
MUSI 221	3	MUSI 307	0
MUSI 307	0	ART 224	2
FOLA	3	FOLA	3
BIOL 100	4	SPCH 361	3
	<u>17</u>	*Elective (General Studies)	3
			<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MUSI	1	MUSI	1
MUSI 501	2	MUSI 415	2
MUSI 307	0	MUSI 307	0
PHIL 260	3	MUSI 618	3
THEA 201	3	MUSI 551	3
*Elective (General Studies)	4	*Elective (General Studies)	4
	<u>13</u>		<u>13</u>

Total Credit Hours: 128

* The General Music degree program requires eleven (11) hours of related elective courses, all which lead directly to the culminating research project (MUSI 551). They must be selected from one of the following allowable elective blocks according to student interest.

MUSI THEATRE ELECTIVE

Thea 405	2 cr.
Thea 457	3 cr.
Thea 620	3 cr.
Thea 630	<u>3 cr.</u>
	11 cr.

MUSI/COMMUNICATIONS (Radio & TV) Electives

Comm 231	1 cr.
Comm 302	3 cr.
Comm 331	1 cr.
Comm 422	3 cr.
Comm 440	<u>3 cr.</u>
	11 cr.

PRE-MUSIC THERAPY (Preparation for Graduate Study in Therapy)

Psyc. 320	3 cr.
Soci. 100	3 cr.
Soci. 200	3 cr.
Musi 427	<u>2 cr.</u>
	11 cr.

MUSIC AND RECREATION

Rec. 260	2 cr.
Phed 229	1 cr.
Phed 271	1 cr.
Phed 442	2 cr.
Red. 454	<u>3 cr.</u>
	11 cr.

MUSIC ELECTRONICS

Musi 416	2 cr.
TBA	<u>9 hrs.</u>
	11 cr.

MUSIC BUSINESS

Buad 422	3 cr.
Buad 425	
Buad 430	3 cr.
Buad 431	3 cr.
Buad 301	<u>2 cr.</u>
	11 cr.

CURRICULUM FOR THE MUSIC MINOR CONCENTRATION

- I. Applied Music 6 Cr. Hrs.
2 Sem. Mus. 113 Principal Applied Instrument/Voice 4 Hrs.
1 Sem. Mus. 213 Principal Applied Instrument/Voice 2 Hrs.
(Interested Students may elect two additional hours)
- II. History of Music 3 Cr. Hrs.
1 Sem. Music 218 Introduction two Music Literature 3 Hrs.
(Interested Students may elect three additional hours)

III. Music Theory 6 Cr. Hrs.

1 Sem. Mus. 101 Theory I 3 Hrs.

1 Sem. Mus. 102 Theory II 3 Hrs.

IV. Performance Ensemble (Minimum) 4 Cr. Hrs.

Music minors must participate in an Ensemble for four semesters

V. Music Electives 3 Cr. Hrs.

TOTAL: 22 Hours

MUSIC COURSE DESCRIPTIONS

MUSIC THEORY

MUSI-101, 102. Theory I and II

Credit 3(2-2)

Review of the fundamentals of music, including the rudiments of music theory- construction and function of scales; intervals, triads and dominant seventh chords in root position and inversions; use of non harmonic tones; correlated analysis, rhythmic, melodic, harmonic, and keyboard drill.

MUSI-110. Fundamentals of Music

Credit 3(1-4)

A comprehensive study of the rudiments of music: notation, intervals, scales, keys, and rhythm. The course is designed for the entering music major and is an elective for non majors. This course may not be used for credit toward degrees in music.

MUSI-119. Sight Singing and Ear Training

Credit 1(0-2)

Fundamentals of musicianship; correlated rhythmic, melodic, and harmonic drills.

MUSI-200, 201. Theory III and IV

Credit 3(2-2)

Modulation, construction and function of seventh, ninth, eleventh, and thirteenth chords in root position and inversions; chromatic harmony; advanced modulation; trends of the twentieth century; corrected analysis, sightsinging, ear training, dictation, and keyboard drill. Prerequisites: Music 101, 102.

MUSI-400. Counterpoint

Credit 3(3-0)

Strict counterpoint in two or more parts; imitation; two and three-part inventions; canon; forms based on the chorale; invertible counterpoint; the fugue. Prerequisites: MUSI 200, 201.

MUSI-402. Form and Analysis

Credit 3(3-0)

Harmonic and melodic structure of the phrase- phrases in combination- the analytical methods; theme and variation, ternary, rondo, binary, sonata, concerto and unique forms; the fugue and related genres. Prerequisites: MUSI 200, 201.

MUSI-414. Composition

Credit 3(2-2)

Introduction to the basic elements of creative writing- melodic writing; organization and structure of musical sound; various approaches to the development of thematic and harmonic materials; as well as orchestration as it applies to composition. Prerequisites: MUSI 101, 102, 200, 201, and/or with the permission of the instructor.

MUSI-501. Arranging

Credit 3(2-2)

Scoring for chorus, band, orchestra, vocal and instrumental chamber ensembles. Prerequisites: MUSI 400, 401.

MUSIC HISTORY AND LITERATURE

MUSI-216. Music Appreciation I

Credit 3(3-0)

A study of melody, harmony, rhythm, simple forms, vocal music, texture and the orchestra. Designed for the general student to provide an introductory survey to the art of music.

MUSI-217. Music Appreciation II**Credit 3(3-0)**

A survey of the literature and styles of the several periods of music history from antiquity through the present. Designed for the general student as a continuation of Music Appreciation I. Prerequisite: MUSI 216.

MUSI-218. Introduction to Music Literature**Credit 2(2-0)**

Familiarization of student with large body of musical material from all branches of musical writing; for vocal and instrumental, solo and ensemble, symphonic and choral groups. Special attention is given to style and structural procedures by principal composers. Designed for students with some musical background.

MUSI-220. History of Black Music in America**Credit 3(3-0)**

A study of black American music from the 17th century to the present. Emphasis is placed on music-forms and styles within the social, economic, and political areas. Formal musical training desirable but not required. Humanities credit given."

MUSI-221. History of Jazz**Credit 3(3-0)**

A general survey of the history of jazz from its beginnings to the present, with major emphasis placed on the stylistic and evolutionary development of the music and the significant contributors to jazz styles. Lectures will be supplemented by films, slides, demonstrations, live concerts, and phonograph recordings. Course is open to non-music majors as well as music majors. No formal knowledge of music theory and history, or previous background in music, is necessary for enrollment.

MUSI-403. History and Literature of Music I**Credit 3(2-2)**

Analyses of main works of music literature presented in historical order; form, harmonic, and contrapuntal devices, orchestration, and other stylistic features investigated against the background of historic artistic and cultural developments-Ancient, Medieval, Renaissance and Baroque periods. Prerequisites: MUSI 101, 102.

MUSI-404. History and Literature of Music II**Credit 3(2-2)**

Analysis of main works of music literature presented in historical order, form, harmonic and contrapuntal devices, orchestration, and other stylistic features investigated against the background of historic, artistic, and cultural development-Classical, romantic, Postromantic and contemporary periods. Prerequisite: MUSI 403.

MUSI-405. Music of the Baroque Period**Credit 2(1-2)**

Analysis of the main works of the principal composers of the early, middle, and late Baroque periods culminating with a more detailed study of the works of Handel and J.S. Bach; vocal, keyboard and other instrumental forms included; emphasis on stylistic characteristics. Prerequisite: MUSI 403.

MUSI-406. Music of the Romantic Period**Credit 2(1-2)**

Intensive study of the works of the principal composers of the Romantic era; emphasis on general and individual stylistic characteristics. Prerequisite: MUSI 404.

MUSI-407. Modern Music from 1890 to the Present**Credit 2(1-2)**

Music of the so-called Viennese school of the twentieth century against the background of late German romanticism and French impressionism; the dissolution of the tonal system and the development of the serial principle- the music of Bartok, Stravinsky and others in the light of nineteenth and twentieth century investigations of folk or national materials and their influence upon serious artist; the relationship of Bartok and Stravinsky to traditional harmonic principles and to the formal structures of the past; other trends in the twentieth century. Prerequisites: MUSI 201, 404.

MUSI-408. The Symphony**Credit 2(1-2)**

The formulation of classical principles of construction by Josef Haydn, with reference to the contributions of Gluck C.P.E. Bach and the Mannheim school; the fulfillment of the classical ideal of the works of Mozart and Beethoven; changing concepts of the symphony after Beethoven; the Romanticists' approach to form; study of the major Romantic symphonies by composers from Schubert to Mahler. Prerequisites: MUSI 201, 404.

MUSI-409. Keyboard Music**Credit 2(1-2)**

Techniques, musicianship, and stylistic aspects of interpretation; from pre-Bach to the present; intellectual, emotional, and imaginative aspects of performance as exemplified by works from leading composers including Bach, Mozart, Haydn, Beethoven, Chopin, Schumann, Debussy, and Moussorgsky; all lectures illustrated at the piano. Prerequisite: MUSI 404.

MUSI-410. Opera**Credit 2(1-2)**

Establishment of the opera as a feasible musico-dramatic genre and the various solutions to problems of the opera as suggested by composers from the seventeenth to the twentieth centuries; special emphasis on the works of Monteverdi, Scarlatti, Gluck, Mozart, Wagner, and Verdi. Prerequisites: MUSI 201, 404.

MUSI-411. The Art Song**Credit 2(1-2)**

Survey of the art song from seventeenth century Italy to present, with special emphasis on the song literatures of Germany, France, and contemporary America- practice in interpretation with particular attention to style and diction. Prerequisite: MUSI 404.

MUSI-412. Chamber Music**Credit 2(1-2)**

Analysis of masterworks of chamber literature for instrumental and vocal ensembles by the main composers for each of the several periods in music history; interpretation. Prerequisite: MUSI 404.

MUSIC EDUCATION

MUSI-103. Class Piano for the Adult Beginner**Credit 1(0-2)**

A programmed, audio-visual course of instruction in piano performance for beginners. Designed for the general college student, the course requires no previous experience with music.

MUSI-104. Class Piano for the Adult Beginner II**Credit 1(0-2)**

A continuation of MUSI 103. Prerequisite: MUSI 103.

MUSI-105. Class Guitar I**Credit 1(0-2)**

Basic instruction in guitar performance for the beginner using a programmed, audio-visual format. Designed for the general college student, the course requires no previous experience with music.

MUSI-106. Class Guitar II**Credit 1(0-2)**

A continuation of MUSI 105. Prerequisite: MUSI 105.

MUSI-111. Basic Performance Techniques.**Credit 2(0-4)**

Study of the basic elements of tone production, reading, techniques and style in the performance of instrumental or vocal music. The course is designed for entering music majors with deficiencies in the primary performance medium and as a music elective for non-majors. This course may not be used for credit toward degrees in music.

MUSI-415. Music Synthesis**Credit 2(2-0)**

This course is an introduction to electronic music, both in its technology and its role in reshaping musical traditions. The course will emphasize waveform analysis with the related mathematical and acoustical concepts. Units will include a history of electronic musical

instruments, related acoustics, exploration of various methods of synthesis, and spectra analyses of waveforms using the mathematics developed by Fourier. Students will create original or mutated timbre for use in an original arrangement or composition. The use of the computer as a tool for composition and score production will be explored.

MUSI-416. Electronic Music

Credit 2(2-0)

This course is designed to introduce the student to electronic music and how it is created. Topics to be covered will be: the history of electronic music, the use and possible applications of the tape recorders, mixers, amplifiers, speakers, microphones, sound generators, synthesizers, etc., and the proper maintenance of all the equipment utilized. Each student will arrange two or more hours per week to work alone in the Electronic Music Studio with the equipment and materials. The creation of original compositions will be a project assignment to be premiered at a public concert.

MUSI-424. Instrument Pedagogy

Credit 2(1-2)

Basic techniques for the teaching and playing of brasswind, woodwind, string and percussion instruments are presented and practiced with emphasis on the implementation of these skills in the K-12 classroom.

MUSI-427. Voice Pedagogy

Credit 2(1-2)

The use of the singing voice; basic principles of singing, interpretation and musicianship; physiology, breathing; tone production, resonance and diction. The application of basic principles to the singing voice; pronunciation, articulation, intonation, attack, legato, sostenuto, flexibility and dynamics; ensemble singing; techniques for producing choral tone in accompanied and unaccompanied styles, choral procedure and repertoire.

PERFORMANCE ORGANIZATIONS

The total number of semester hours to be earned through performance organization courses is specified in the outlines of major curricula. Each student with a major in music is required to maintain continuous membership in a departmentally sanctioned performance ensemble. If the principal applied subject is a wind or percussion instrument, the student must elect band; if the principal applied subject is voice or piano, the student must elect choir. The organization elected must be repeated each semester as specified until the required number of semester hours has been earned. Other performance organization courses are elected as required of the several curricula and similarly repeated for credit it until the necessary semester hours have been earned.

MUSI-300. University Bands

Credit 2(0-5)

The University Marching Band is organized in the fall of the year (first semester) and plays for all football games. It is open to all qualified students, both men and women. The Symphony Band functions after the football season and continues for the rest of the year. Membership in both the Symphony and Marching Bands is through audition with the Director of Bands. May be repeated for credit each semester.

MUSI-301. University Choir

Credit 2(0-5)

An organization designed to perform a diversity of choral literature ranging from the classics to gospel. Numerous on and off-campus public appearances, as well as at least one tour are planned each year. Membership is open to all qualified students by audition. May be repeated for credit.

MUSI-302. Brass Ensemble

Credit 1(0-2)

The study and performance of literature for brass instrument chamber groups from all periods of music history and in all styles. Frequent public concerts. Membership is open to all

qualified students, both men and women through audition with the director. May be repeated for credit each semester.

MUSI-303. Woodwind Ensemble

Credit 1(0-2)

The study and performance of literature for woodwind chamber music groups and in all styles. Frequent public concerts. Memberships is open to all qualified students, both men and women through audition with the director. May be repeated for credit each semester.

MUSI-304. Percussion Ensemble

Credit 1(0-2)

The study and performance of literature for percussion chamber groups representing a wide variety of styles. Designed to develop skill in ensemble performance on all of the instruments of percussion used in this growing modern repertoire membership is open to all qualified students, both men and women through audition with the director. Frequent public concerts. May be repeated for credit each semester.

MUSI-305. Opera Workshop

Credit 1(0-2)

Musical and dramatic group study and performance of excerpts from the operatic repertoire. Includes an annual production of a standard opera and/or contemporary chamber work, with staging, costumes, and scenery. Students must secure the approval of their university voice instructor before enrolling. May be repeated for credit each semester.

MUSI-306. Chamber Singers

Credit 1(0-2)

A choral organization designed to perform a wide variety of compositions written for voices representing various musical styles and periods. Frequent public concerts. Membership is open to qualified students through audition with the director. May be repeated for credit each semester.

MUSI-307. Recital Seminar

Credit 0(0-1)

A weekly assembly of music students with members of the faculty, providing opportunity for experience in public performance before an audience, lecture and discussion of problems in the general area of performance including ensemble playing and singing, conducting, accompanying, stage department, also performance. (Required of all music majors during each semester of residence; a grade of pass (P) or fail (F) will be assigned on the basis of participation and attendance.)

MUSI-308. University Jazz Ensembles

Credit 1(0-2)

The study and performance of jazz literature in all styles and idioms with special emphasis on contemporary compositions. Membership is open to all qualified students through audition with the director. May be repeated for credit each semester.

MUSI-309. University Orchestra

Credit 2(0-4)

An organization designed to perform a wide range of orchestral compositions representing various musical styles, and periods. Emphasis is placed on the more important of the standard symphonic works from the eighteenth, nineteenth, and twentieth centuries. Membership is open to all qualified students through audition with the director. May be repeated for credit each semester.

APPLIED MUSIC

Individual instruction is available in the following branches of applied music as both principal and secondary areas of study:

Piano	Flute	Bassoon	Trombone
Voice	Oboe	French Horn	Baritone Horn
Percussion	Clarinet	Trumpet	Tuba

In the principal area of performance, each student receives a one hour individual lesson each week and must practice for at least two (2) hours each day to earn two semester hours

credit. To earn three semester hours credit, the student must practice a minimum of three hours each day in addition to his lesson. In the secondary area of performance, each student receives a one hour lesson each week and is required to practice a minimum of one hour each day to earn one semester hour credit. To earn two semester hours credit, each student must practice a minimum of two hours each day in addition to his lesson.

MUSI-503. Score Reading and Conducting

Credit 2(1-2)

Fundamental conducting beat patterns, size of beats, and use of each hand; discussion and study of musical terminology; conducting experience with laboratory group. Transposition; characteristics and ranges of instruments-study of tempos and dynamics; continued conducting experience with both choral and instrumental laboratory groups.

MUSI-550. Senior Recital

Credit 1(0-1)

Designed for the senior music major to demonstrate a high level of proficiency on a chosen instrument or in an applied music field (either brass, woodwinds, percussion, voice, strings or keyboards) in a concert situation. The course will culminate in a formal concert performance of hallmarks of music literature. This course is taken concurrently with MUSI 513. For Music Education majors the recital should be presented the semester before student teaching occurs. For Bachelor of Arts majors it should be presented during the second semester of MUSI 513. Prerequisites: MUSI 113, 213, 413.

MUSI-114, 124, 134, 144, 154, 164. Applied Music Secondary I

Credit 1(0-1)

Semi-private or class study on a secondary instrument. Students whose principal performing medium is voice or one of the orchestral instruments are required to study the piano as the secondary instrument. Students whose principal performing medium is the piano may choose either voice or an orchestral instrument as the secondary instrument. Piano students pursuing the music education curriculum with a choral concentration must study voice as the secondary applied area. Emphasis is placed on the development of sound basic performance technique. May be repeated for credit. Two semesters are required.

MUSI-214, 224 234, 244, 254 or 264. Applied Music Secondary II

Credit 1(0-1)

Continued development of basic performance skills that were begun in MUSI 114. Attention will be given to preparation for the comprehensive examination on the secondary instrument required of all students.

PIANO

Requirements for Admission—The applicants who elect piano as their principal instrument should be able to play all major and minor scales and arpeggi at a moderate tempo. They should play with technical ease and musical understanding, compositions equivalent in difficulty to the following: Clementi *Sonatina*, Op. 36, No. 6; Mozart, *Fantasia in D Minor*, Bach *Little Preludes*, or Burgmuller, *Studies*, Op.100.

MUSI-163. Principal Applied Piano

A three-part invention by Bach. A movement of a Sonata by Haydn, Mozart, or Beethoven. Work of moderate difficulty by a Romantic composer. Scales and arpeggios in parallel or contrary motion at a moderately rapid tempo. Sight reading.

MUSI-263. Principal Applied Piano

A prelude and fugue from the Well Tempered Clavier by Bach. Completion of the Sonata started in 163. A work from the Romantic school. A work written since 1900. Scales and arpeggios at rapid tempo. Sight reading.

MUSI-463. Principal Applied Piano

Dance forms from French suites or parties by Bach. A sonata by Haydn, Mozart or Beethoven one movement memorized. A work from the Romantic School. A contemporary work. Sight reading.

MUSI-563. Principal Applied Piano

A prelude and fugue from the Well-Tempered Clavier by Bach, a sonata by Haydn, Mozart, or Beethoven, one movement memorized. A work from the Romantic school. A contemporary work. Sight reading.

MUSI-560. Accompanying

Analysis and practice in piano accompaniment of singers and instrumentalists; sight reading and transposition; discussion of style and performance; experience in public performance. May be repeated for credit each semester. Prerequisite. Consent of instructor.

VOICE

MUSI-100. Diction for Singers**Credit 1(0-2)**

"A course designed to familiarize students with the pronunciation of English, Italian and German language through the study and use of the International Phonetic Alphabet."

MUSI-153. Principal Applied Voice

- 1) Competencies: Correct posture, breathing habits, phrasing, various five-note scales, diction.
- 2) Studies: Simple English and Italian art songs, folk songs, spirituals.
- 3) Solos: Six songs in English and Italian to be memorized each semester. Representative composers: Scarlatti, Handel, Purcell.

MUSI-253. Principal Applied Voice

- 1) Competencies: Correct posture, breathing habits, phrasing, diction, scales and arpeggios.
- 2) Studies: English and Italian art songs, German art songs, folk songs, spirituals.
- 3) Solos: English songs in English, Italian, and German to be memorized each semester. Representative composers: Durante, Scarlatti, Schumann.

MUSI-453. Principal Applied Voice

- 1) Competencies: Continuation of 213.
- 2) Studies: English and Italian art songs, German songs, French art songs, folk songs and spirituals.
- 3) Solos: Nine songs in English, Italian, German, and French to be memorized each semester. Representative composers: Schumann, Schubert, Strauss, Faure, Britten, Mozart.

MUSI-553. Principal Applied Voice

- 1) Competencies: Continuation of 413 with emphasis on preparation for senior recital.
- 2) Studies: Continuation of 413 with more intricate scales and arpeggios.
- 3) Solos: 10 songs in English, German, Italian, and French to be memorized. Representative composers: Wolf, Schumann, Faure, Verdi, Britten, Handel, Debussy.

PERCUSSIONS

Requirements for Admission—The candidate shall demonstrate satisfactory performing ability in at least one of the following areas of percussion.

Performance—Snare drum, Xylophone, marimba and timpani. These competencies will include:

- 1) The ability to perform a solo.
- 2) The ability to perform an excerpt from a book in which the applicant has studied that will demonstrate musicianship and technical skill.
- 3) The ability to play at sight representative literature which is characteristic of the instrument.
- 4) Previous ensemble in band and/or orchestra. Additional competencies for snare drum:
 - a. Basic knowledge of rudiments.
 - b. The performance of a Sousa march of the equivalent.

Additional competencies for xylophone marimba: The ability to play major scales through 4 flats and 4 sharps in one octave.

Additional competencies for timpani:

- a. Basic knowledge of timpani techniques.
- b. A thorough knowledge of range of each timpano.

MUSI-143, 243. Principal Applied Percussions

- 1) Competencies:
 - a. Snare Drum; Fundamentals, military techniques, reading and control.
 - b. Mallets: Fundamentals, reading technique—musical orientation.
- 2) Studies: Price, Beginning Snare Drum; Goldeberg, Mallet Instruments; Stone, Stack Control; Bower, Drum Method; Gardner, Modern Method, Book I, Stone, Mallet Control.
- 3) Solos: Wilcaxon, Rudimental Solos; Price, Exhibition Drum Solo; Colgrass, Advanced Snare Drum Solo; Brever Easy —Medium Mallet Solos; Stone, Military Drum Beats.

MUSI-443, 543. Principal Applied Percussions

- 1) Competencies:
 - a. Snare Drum; Fine control, orchestra techniques.
 - b. Mallets; Reading, advanced techniques, tambourine, castanets, brass drum, and cymbals.
 - c. Timpani: Kettle technique, tuning exercises and control.
 - d. Latin-American Instruments.
 - e. Percussion, “Trap” techniques, tambourine, castanets, brass drum, and cymbals. Basic skills on each.
- 2) Studies: Price, Techniques and Exercises for Triangle, Tambourine and Castanets; Brewer, Daily Studies; Goldenberg, Mallet Instruments. Goodman, Timpani Method-Fresia, Timpani Method- Tourte, Snare Drum Technique; Gardner, Modern Method, Book II, Mallets, Chopin, Advanced Techniques for the Modern Drummer.
- 3) Solos: McKenzie, Graded Timpani Solos; Britton, Timpani Solo-Hart, Timpani Solos; Price, Unaccompanied Timpani Solos; Brewer, 3 and 4 Mallet Solos, Quick 3 and 4 Mallet Solos; Stone Rudimental Drum Solos; Duets and Quintets.

WIND INSTRUMENTS

Requirements for Admission—The candidate shall show evidence:

- 1) Basic development in embouchure and articulation.
- 2) Knowledge of fingering and alternates.
- 3) Satisfactory tone quality and control.
- 4) Ability to play major scales through 4 flats and 4 sharps, in eight notes (M.M.d-72) and the chromatic scale both slurred and articulated.
- 5) Minimum—Two octave range.
- 6) Ability to play a simple song demonstrating musicianship which includes phrasing and expression.
- 7) Previous study in the equivalent of the Rubank Advanced Method.
- 8) Previous ensemble experience in band and/or orchestra.
- 9) Ability to play at sight representative literature which is characteristic of the instrument.

MUSI-113-1, 213-1. Principal Applied Trumpet

- 1) Competencies: Breathing; elementary embouchure and tone production; tonguing as applied to various articulations; coordination of tone production habits through progressive major and minor scales; practical problems of artistic performance.
- 2) Studies: "Studies: Arban's selected studies; selected studies by Getchell, Hovey, Her-ing and Clarke."
- 3) Literature-Selected from NIMAC—Music Educator's National Conference.

MUSI-413-1, 513-1. Principal Applied Trumpet

- 1) Competencies: Intonation; embouchure techniques; breath control and tone quality; articulation; reading; style; performance techniques.
- 2) Studies: Rubank, Advanced Method, Arbam Cumpleti Method for Trumpet, Fischer; Laube - CIB Contest Album; Bantold-Orchestral Excerpts.
- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-113-2, 213-2. Principal Applied French Horn

- 1) Competencies: Breathing, embouchure and tone production; tonguing; progressive major and minor scale technique; practical problems of artistic performance.
- 2) Studies: Rubank, Intermediate Method for French Horn; Modern Pares Foundation.
- 3) Studies: Whistler, Daily Exercises for French Horn, Pottag.
- 4) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-413-2, 513-2. Principal Applied French Horn

- 1) Competencies: Intonation, embouchure techniques, breath control and tone quality; articulations; reading; style; performance techniques.
- 2) Studies: Rubank, Advanced Method for French Horn.
- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-123-1, 223-1. Principal Applied Trombone-Baritone

- 1) Competencies: Breathing, elementary embouchure and tone production- tonguing as applied to various instruments, coordination of tone production habits through progressive major and minor scales; practical problems of artistic performances.
- 2) Studies: Trombone and Baritone, Arbans-Prescott Method for Trombone-Baritone—Carl Fisher, Inc., Rubank Intermediate Method for Trombone-Baritone. Skornicka

and Boltz Rubank, Rubank, Inc. Modern Pares Foundation. Studies for Trombone and Bariton—Whistler.

- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-423-1, 523-1. Principal Applied Trombone-Baritone

- 1) Competencies: Intonation, embouchure techniques; breath control and tone quality; articulations; reading; style; performance techniques.
- 2) Studies: Rubank, Advanced Method for Trombone and Baritone.
- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-123-2, 223-2. Principal Applied Tuba

- 1) Competencies: Breathing, elementary embouchure and tone production; tonguing as applied to various instruments coordination of tone production habits through progressive major and minor scales; practical problems of artistic performances.
- 2) Studies: Tuba, Rubank Intermediate Method for Brass —Skornicka and Boltz, Rubank Inc. First Book of Practical Studies for Tuba—Hovey N. Beiwin, Inc. Vandercook Etudes for Bass—Rubank Inc.
- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-423-2, 513-2. Principal Applied Tuba

- 1) Competencies: Intonation, embouchure techniques breath control and tone quality; articulation; reading; style, performance techniques.
- 2) Studies: Rubank, Advanced Method for Tuba.
- 3) Literature: Selected from NIMAC—Music Educator's National Conference.

MUSI-113-1. Principal Applied Flute

- 1) Competencies: Major and minor scales through 5 sharps and 5 flats. Emphasis on fingering and tonal development.
- 2) Studies: Soussmann, Complete Method for Flute; Anderson, 24 Progressive Studies, Op. 33.
- 3) Literature: Bizet, Minuet; Mozart, Adagio; Handel, Sonatas.

MUSI-233-1. Principal Applied Flute

- 1) Competencies: All Major and Minor scales throughout the practical performing range. Emphasis on sight reading.
- 2) Studies: Cavally, Melodious and Progressive Studies for Flute Soussmann.
- 3) Literature: Bach, Suite in B. Minor; Mozart, concertos.

MUSI-433-1. Principal Applied Flute

- 1) Competencies: Continued scale study, emphasis on performing literature.
- 2) Studies: Soussman—Moyse, Flute Studies.
- 3) Literature: Bach, Sonatas; Debussy, Syrinx.

MUSI-533-1. Principal Applied Flute

- 1) Competencies: Continued emphasis on performing literature.
- 2) Studies: Schmitd, Orchestral Studies.
- 3) Literature: Chaminade, Concertino, Hindemith, Sonata.

MUSI-133-2. Principal Applied Oboe

- 1) Competecies: Major and Minor Scales through 5 sharps and 5 flats. Emphasis on fingering and total development.

- 2) Studies Ferling, 144 Preludes and Studies; Barrett, Completed Method for Oboe.
- 3) Literature: Franck, Piece V; Piece in G. Minor; Handel, Sonatas.

MUSI-233-2. Principal Applied Oboe

- 1) Competencies: All Major and Minor Scales throughout the practical performing range. Emphasis on sight reading. Reed adjustment.
- 2) Studies: Barret, Method; Tustin, Technical Studies.
- 3) Literature: Schumann, Three Romances; Telemann, Concerto in F Minor.

MUSI-433-2. Principal Applied Oboe

- 1) Competencies: Continued scale study, emphasis on performing literature. Reed Making.
- 2) Studies: Tustin, Studies; Prestin.
- 3) Literature: Handel, Sonata in G. Minor, Goosens, Concerto.

MUSI-533-2. Principal Applied Oboe

- 1) Competencies: Continued emphasis on performing literature.
- 2) Studies: Orchestral Literature.

MUSI-133-3. Principal Applied Clarinet

- 1) Competencies: Major and Minor Scales through 5 Sharps and 5 flats. Emphasis on fingerings and tonal development.
- 2) Studies: Klose Celebrated Method for Clarinet and Rose 32 Etudes.
- 3) Literature: Stubbins, Recital Literature for the Clarinet, Vol. II.

MUSI-233-3. Principal Applied Clarinet

- 1) Competencies: All Major and Minor scales throughout the practical performing range. Emphasis on sight reading. Reed adjustment.
- 2) Klose, Rose 40 Etudes.
- 3) Literature: Stubbins, Recital Literature, Vols. I and II.

MUSI-433-3. Principal Applied Clarinet

- 1) Competencies: Continued scale study, emphasis on performing literature.
- 2) Studies: Baermann, Method for Clarinet; Jean Jean, 18 Etudes de Perfectionnement.
- 3) Literature: Stubbins, Recital Literature, Vol. III (The Concertos)

MUSI-533-3. Principal Applied Clarinet

- 1) Competencies: Continued emphasis on performing literature.

MUSI-133-4. Principal Applied Saxophone

- 1) Competencies: Major and Minor scales through 5 sharps and 5 flats. Emphasis on fingerings and tonal development.
- 2) Studies: DeVille, Universal Method; Ebdressen, Endrejen, Supplementary Studies.
- 3) Literature: Handel, Sonatas.

MUSI-233-4. Principal Applied Saxophone

- 1) Competencies: All Major and Minor Scales through the practical performing range. Emphasis on sight reading. Reed adjustment.
- 2) Studies: DeVille; Rascher, Top Tones for Saxophone.
- 3) Literature: Bozza, Aria, Casadesus, Romance.
- 2) Studies: Baermann- Jean Jean, Orchestral Studies.
- 3) Literature: Bernstein, Sonata; Debussy, Rapsodie.

MUSI-433-4. Principal Applied Saxophone

- 1) Competencies: Continued scale study, emphasis on performing literature. Introduction to jazz improvising.
- 2) Studies: DeVille; Rascher, 158 Saxophone Exercises.
- 3) Literature: Creston, Sonata, Debussy, Rapsodie-Fasch Sonata; Music Minus one Saxophone.

MUSI-533-4. Principal Applied Saxophone

- 1) Competencies: Continued emphasis on performing literature.
- 2) Studies: Traler-Lazarus, Virtuoso Studies.
- 3) Literature: Bozza, Scaramouche.

MUSI-133-5. Principal Applied Bassoon

- 1) Competencies: Major and Minor scales through 5 sharps and 5 flats. Emphasis on fingerings and tonal development.
- 2) Studies: McDowell, Practical Studies, Book I; Kovar, 24 Daily Exercises; Wessenborn, Practical Method Bassoon.

MUSI-233-5. Principal Applied Bassoon

- 1) Competencies: All Major and Minor scales throughout the practical playing range. Emphasis on sight reading. Reed adjustment and making.
- 2) Studies: Wesseborn, Method for Bassoon; Kovar, 24 Daily Exercises; McDowell, Practical Studies, Book II
- 3) Rep. Literature: Telemann, Sonata in F Minor, Weber Concerto in F (Slow Movement)

MUSI-433-5. Principal Applied Bassoon

- 1) Competencies: Continued scale study, emphasis on performing literature.
- 2) Studies: Pierne, Concert Piece, Galliard, Sonatas, Mozart Concerto.

MUSI-533-5. Principal Applied Bassoon

- 1) Competencies: Continued emphasis on performing literature. Orchestral Studies.
- 2) Studies: Orchestra Passages.
- 3) Literature: Hindemith, Sonata.

Advanced Undergraduate and Graduate**MUSI-609. Music in Early Childhood****Credit 3(2-2)**

A conceptual approach to the understanding of musical elements- and understanding of the basic activities in music in early childhood; modern trends in music education; Kodaly and Orff methods.

MUSI-610. Music in Elementary School Today**Credit 3(2-2)**

Music in the elementary school curriculum- creating a musical environment in the classroom; child voice in singing, selection and presentation of rote songs; development of rhythmic and melodic expressions; directed listening; experimentation with percussion and simple melodic instruments; criteria for utilization of notational elements; analysis of instrumental materials.

MUSI-611. Music in the Secondary School Today**Credit 3(3-0)**

Techniques of vocal and instrumental music instruction in the junior and senior high schools; the general music class; the organization, administration and supervision of music programs, as well as music in the humanities. This course includes the adolescent's voice and its care;

the testing and classification of voices; operetta production; the instrumental program; and training glee clubs, choirs, bands, and instrumental ensembles.

MUSI-614. Choral Conducting of School Music Groups

Credit 2(0-4)

Rehearsal techniques; balance, blend and relationship of parts to the total ensemble; analysis and interpretation of literature appropriate for use in school at all levels of ability; conducting experience with laboratory group. MUSI-616. Instrumental Conducting of School

Music Groups

Credit 2(0-4)

Rehearsal techniques; balance blend and relationship of parts to the total ensemble; analysis and interpretation of literature appropriate for use in school groups at all levels of ability; conducting experience with laboratory group.

MUSI-618. Psychology of Music

Credit 3(2-2)

The study of physical and psychological properties of musical sounds and the responses of the human organism to musical stimuli.

MUSI-620. Advanced Music Appreciation

Credit 3(2-2)

Analytic studies of larger forms from all branches of music writing- Special emphasis on style and structural procedures by principal composers; works taken from all periods in music history. Designed for students with previous study of music appreciation.

RESEARCH

MUSI-551. Independent Study in Music

Credit 3(0-6)

A mentored independent research project, progressing from the proposal stage through final reporting and jury evaluation, devised by the student in consultation with a music faculty advisor. Prerequisites: permission of selected faculty advisor and Department Chair, and Junior or Senior academic classification.

DIRECTORY OF FACULTY

Cedric L. Adderley, B.M. Ed., East Carolina University; M.M., the University of South Carolina; Instructor

Walter F. Carlson, Jr., B.S., A&T College; M. Mus., University of Michigan; Adjunct Associate Professor

Elland Forrester, B.S., Alabama A&M University; M.A., Eastern Illinois University; Instructor

Johnny B. Hodge, B.A., North Carolina Central University; M.M., University of North Carolina at Greensboro, Ph.D., American University; Professor and Director of University Bands

Judith W. Howle, B.M., Performer's Diploma; Eastman School of Music, University of Rochester; M.M., University of N.C. at Greensboro; Assistant Professor

Andrea Jenkins, B.A., Spelman College; M.A., Eastern Illinois University; Instructor

Linda F. Parker, B.S., North Carolina A&T State University; M.A., University of Iowa; Ph.D., University of Minnesota; Assistant Professor

Eric O. Poole, B.A., North Carolina A&T State University, M.S., Howard University; Instructor

William C. Smiley; B.M.E., Jackson State College; M.S., University of Illinois; Ed.D., University of North Carolina at Greensboro; Professor

Clifford E. Watkins, B.A., Clark College; M.Mus.Ed., Ph.D., Southern Illinois University; Professor and Chairperson

Department of Physics

Caesar Jackson
Chairperson

OBJECTIVES

The specific objectives of the Department are:

1. To prepare majors for graduate study and careers in physics, medicine and other professional fields.
2. To prepare majors for work in research and development laboratories.
3. To prepare majors to teach physics and mathematics in high school.
4. To provide majors in other departments with a clear understanding of the laws of physics and their applications.
5. To provide all students with the ability to make meaningful observations, to convert these observations into mathematical language, and to reach logical conclusions.

DEGREES OFFERED

Physics—B.S.

Physics, Secondary Education—B.S.

Engineering Physics—B.S.

GENERAL PROGRAM REQUIREMENTS

In addition to the general admission requirements of the University, a student must have two units of algebra, one unit of plane geometry, and 1/2 unit of trigonometry.

DEPARTMENTAL REQUIREMENTS

Professional Physics Major—The major in professional physics must complete 128 semester hours of University courses. Included in the 128 semester hours are 47 semester hours of physics courses. A minimum grade of “C” must be achieved in all Math and Physics courses.

A student may complete requirements for a professional physics degree and also satisfy admission requirements for some medical schools by taking the following courses as electives: BIOL 160, 140, 260 and CHEM 221 and 222. Many medical schools may admit students after the completion of the third year of study.

Engineering Physics Major—The major in engineering physics must complete 128 semester hours of University courses. Included in the 128 semester hours are 41 semester hours of physics and 24 semester hours in engineering. A minimum grade of “C” must be achieved in all Math and Physics courses.

Physics Secondary Education—The teaching major must complete 128 semester hours of University courses. Included in these 128 hours are 32 semester hours of physics courses. A minimum grade of “C” must be achieved in all Math and Physics courses.

ACCREDITATION

All Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education and approved by the North Carolina State Department of Public Instruction.

CAREER OPPORTUNITIES

A degree in physics will allow the student to go directly into research activity, study for an advanced degree, or teach in junior or senior high school. A study of physics may give the technical background useful in such fields as: Medicine, Law, Computer Science, Astronomy, or Business.

CURRICULUM FOR THE MAJOR IN PROFESSIONAL PHYSICS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 102	1	PHYS 241	3
PHYS 110	2	PHYS 251	1
PHYS 111	1	MATH 132	4
MATH 131	4	ENGL 101	3
ENGL 100	3	GLOBAL STUDIES ¹	3
AFR. AMER. STUDIES ¹	3	FOREIGN LANGUAGE	<u>3</u>
FOREIGN LANGUAGE	<u>3</u>		17
	17		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 242	3	PHYS 405	3
PHYS 252	1	PHYS 406	3
MATH 231	4	MATH 240	3
CHEM 106	3	CHEM 107	3
CHEM 116	1	CHEM 117	1
SOC./BEHAV. SCIENCE ³	<u>3</u>	Humanities Elective ²	<u>3</u>
	15		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 400	3	PHYS 401	3
PHYS 415	3	PHYS 416	3
PHYS 420	3	PHYS 421	3
PHYS 520	2	Physics Elective	3
MATH 331	3	MATH 332	<u>3</u>
Physical Ed. Electives	<u>2</u>		15
	16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 430	3	Technical Electives ⁴	4
Physics Elective	3	Free Electives	6
Technical Electives ⁴	4	SOC./BEHAV. SCIENCE ³	3
SOC./BEHAV. SCIENCE ³	3	Humanities Elective ²	3
Humanities Electives ²	3		<u>16</u>
	<u>16</u>		

¹ One course in African American Studies and one course in Global Studies required as a Humanities or a Social Science.

² Four courses required - Art, English, Humanities, Music, Philosophy, or Speech. May include the African American Studies requirement.

³ Four courses required - Anthropology, Economics, Geography, History, Political Science, or Sociology. May include the African American and/or the Global Studies requirements.

⁴ Physics 4xx or 5xx level recommended or above 1xx level in other technical areas.

CURRICULUM FOR THE MAJOR IN ENGINEERING PHYSICS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 102	1	PHYS 241	3
PHYS 110	2	PHYS 251	1
PHYS 111	1	MATH 132	4
MATH 131	4	ENGL 101	3
ENGL 100	3	GLOBAL STUDIES ¹	3
AFR. AMER. STUDIES ¹	3	FOREIGN LANGUAGE	3
FOREIGN LANGUAGE	3		<u>17</u>
	<u>17</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 242	3	PHYS 405	3
PHYS 252	1	PHYS 406	3
MATH 231	4	MATH 240	3
CHEM 106	3	Engineering Electives	4
CHEM 116	1	Humanities Elective ²	3
SOC./BEHAV. SCIENCE ³	3		<u>16</u>
	<u>15</u>		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 400	3	PHYS 401	3
PHYS 415	3	PHYS 416	3
PHYS 420	3	PHYS 421	3
PHYS 520	2	Engineering Electives	4
MATH 331	3	MATH 332	3
Physical Ed. Electives	2		16
	16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 430	3	Engineering Electives	9
Engineering Electives	7	SOC./BEHAV. SCIENCE ³	3
SOC./BEHAV. SCIENCE ³	3	Humanities Elective ²	3
Humanities Elective ²	3		15
	16		

¹ One course in African American Studies and one course in Global Studies required as a Humanities or a Social Science.

² Four courses required - Art, English, Humanities, Music, Philosophy, or Speech. May include the African American requirement.

³ Four courses required - Anthropology, Economics, Geography, History, Political Science, or Sociology. May include the African American and/or the Global Studies requirements.

CURRICULUM FOR THE MAJOR IN PHYSICS SECONDARY EDUCATION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 102	1	PHYS 241	3
PHYS 110	2	PHYS 251	1
PHYS 111	1	MATH 132	4
MATH 131	4	ENGL 101	3
ENGL 100	3	SPEECH 250	3
SOCIAL SCIENCE ¹	3	SOCIAL SCIENCE ¹	3
PHED 200	2		17
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 242	3	PHYS 405	3
PHYS 252	1	PHYS 406	3
MATH 231	4	CHEM 106	3
PSYC 320	3	CHEM 116	1
ENGL 200	3	ENGL 201	3
CUIN 300	2	PHED 101	1
	16	CUIN 301	2
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 400	3	PHYS 401	3
PHYS 415	3	PHYS 416	3
MATH 240	3	BIOL 140 (Botany)	4
FOREIGN LANGUAGE	3	FOREIGN LANGUAGE	3
Free Electives	2	CUIN 436	3
CUIN 400	3		16
	<hr/> 17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 520	2	CUIN 500	3
PHYS 101 (Astronomy)	3	CUIN 535	3
EASC 201 (Earth Science)	3	CUIN 560	6
BIOL 160 (Zoology)	4	CUIN 624	3
AFR. AMER. STUDIES ²	3		15
	<hr/> 15		

¹ HIST 100, 101 or HIST 204, 205

² One course in African American Studies and one course in Global Studies required as a Humanities or a Social Science.

COURSES AND DESCRIPTION FOR PHYSICS

PHYS-101. Introduction to Astronomy **Credit 3(3-0)**
 Fundamentals of astronomy with emphasis on methods of observation and the solar system. Astronomical instruments including optical and radio telescopes. The nature of the sun moon, planets and other objects of the solar system.

PHYS-102. Physics Orientation **Credit 1(1-0)**
 Lectures, seminars, and laboratory demonstrations. Orientation to the Physics Department. Presentation of selected topics, student participation, and discussions.

PHYS-110. Survey of Physics **Credit 2(2-0)**
 A one-semester study of selected topics in physics from each of the following: Newtonian mechanics, heat, sound, electricity and magnetism, light, atomic, and nuclear physics, and relativity. Prerequisites: MATH 102, 111. Corequisite: PHYS 111.

PHYS-111. Survey of Physics Lab **Credit 1(0-2)**
 A laboratory course to be taken concurrently with PHYS 110, Survey of Physics. Students will perform experiments designed to verify and/or clarify physics concepts. Corequisite: PHYS 110.

PHYS-211. Technical Physics I **Credit 3(4-0)**
 A study of basic principles of mechanics, thermodynamics, wave motion, sound, electricity, magnetism, optics, and modern physics. Emphasis is placed on applications of physics in modern technology. Prerequisite: MATH 111. Corequisites: MATH 112, and PHYS 216.

PHYS-212. Technical Physics II **Credit 3(4-0)**
 A continuation of PHYS 211. Prerequisite: PHYS 211. Corequisite: PHYS 217.

- PHYS-216. Technical Physics I Laboratory** **Credit 1(0-2)**
A qualitative and quantitative study of certain physical systems; critical observations and codification of data are emphasized. Corequisite: PHYS 211.
- PHYS-217. Technical Physics II Laboratory** **Credit 1(0-2)**
A continuation of PHYS 216. Corequisite: PHYS 212.
- PHYS-225. College Physics I** **Credit 3(3-0)**
A study of the fundamental principles of mechanics, properties of motion, heat and thermometry, electromagnetism, wave motion, sound, light, and modern physics. Calculus is not used, however, a knowledge of analytical geometry is required. Prerequisite: MATH 111. Corequisite: PHYS 235.
- PHYS-226. College Physics II** **Credit 3(3-0)**
A continuation of PHYS 225. Prerequisite: PHYS 225. Corequisite: PHYS 236.
- PHYS-235. College Physics I Laboratory** **Credit 1(0-2)**
A course which will emphasize the importance of experimentation and observations in the development of a physical science. A selected group of experiments will be undertaken. Corequisite: PHYS 225.
- PHYS-236. College Physics II Laboratory** **Credit 1(0-2)**
A continuation of PHYS 235. Corequisite: PHYS 226.
- PHYS-241. General Physics I** **Credit 3(3-1)**
This is the calculus based study of physics which covers the fundamental principles of mechanics, thermodynamics, electromagnetism, wave motion, sound, and optics. Corequisites: MATH 132, PHYS 251.
- PHYS-242. General Physics II** **Credit 3(3-1)**
This course is a continuation of PHYS 241 and continues coverage of the fundamental principles of mechanics, thermodynamics, electromagnetism, wave motion, sound, and optics. Corequisite: PHYS 252.
- PHYS-251. General Physics I Lab** **Credit 1(0-2)**
This is a laboratory course where a selected group of physics experiments will be performed. Emphasis is placed on the development of experimental technique, analysis of data, and physical interpretation of experimental results. Corequisite: PHYS 241.
- PHYS-252. General Physics II Lab** **Credit 1(0-2)**
A continuation of PHYS 251. Corequisite: PHYS 242.
- PHYS-400. Physical Mechanics I** **Credit 3(3-0)**
This is a course in Newtonian mechanics which along with PHYS 401 includes particle dynamics, conservation laws, vibrational motion, central field motion, rigid body dynamics, Hamilton's principle and Lagrange's equation, and Hamilton's equations. Prerequisite: PHYS 242, MATH 231.
- PHYS-401. Physical Mechanics II** **Credit 3(3-0)**
This course is a continuation of Physics 400 and continues coverage of particle dynamics, conservation laws, vibrational motion, central field motion, rigid body dynamics, Hamilton's principle and Lagrange's equation, and Hamilton's equation. Prerequisite: PHYS 400.
- PHYS-405. Mathematical Physics** **Credit 3(3-0)**
This is a course in the applications of mathematics to solutions of physical problems. It covers selected topics in vector analysis, differential equations, special functions, calculus of vibrations, eigenvalues and eigenfunctions, and matrices. Prerequisite: MATH 231.

PHYS-406. Introduction to Modern Physics **Credit 3(3-0)**

A study of the basics of special relativity, quantum, atomic, molecular, statistical, solid state, nuclear, and particle physics. Prerequisites: PHYS 242 or 226, MATH 132.

PHYS-415. Electromagnetism I **Credit 3(3-0)**

This is an intermediate course in electromagnetism which along with PHYS 416 includes the study of electric fields and potentials, electric current and magnetic fields, solutions to Maxwell's equations, plane waves, polarization, propagation in media, waveguides and resonant cavities, refraction, and dispersion. Prerequisites: PHYS 242, MATH 231.

PHYS-416. Electromagnetism II **Credit 3(3-0)**

This course is a continuation of PHYS 415. Prerequisites: PHYS 415.

PHYS-420. Quantum Physics I **Credit 3(3-0)**

This course presents the postulates of wave mechanics and the Schrodinger equation. It explores solutions of the Schrodinger equation for the harmonic oscillator, the square well, and the hydrogen atom. The course covers the concepts of spin and angular momentum, and it investigates the following: approximate solutions of the Schrodinger equation, perturbation theory, Stark and Zeeman effects. Prerequisite: PHYS 406.

PHYS-421. Quantum Physics II **Credit 3(3-0)**

This is a continuation of Physics 420. Physical studies include the one and two electron atoms, the hydrogen atom and the alkalis, hydrogen molecule and molecular bond. Other subjects covered include the deuteron problem in nuclear physics, alpha decay, scattering theory, and the nature of the nuclear force. Also the motion of a particle in a periodic potential, the role of Quantum Physics in solids, and operator formalism are explored. Prerequisite: PHYS 420.

PHYS-430. Thermodynamics & Statistical Mechanics **Credit 3(3-0)**

This course reviews the principles of thermodynamics which include macroscopic variables, thermodynamic equilibrium, the thermodynamic laws, and kinematic theory. The fundamentals of statistical mechanics are covered which include microcanonical and canonical ensembles, partition functions, Bose and Fermi statistics, and the Boltzmann equation. Prerequisite: PHYS 400.

PHYS-450. Waves and Optics **Credit 3(3-0)**

This course explores wave phenomena, It covers the propagation, reflection, refraction of light and includes studies of lenses and optical instruments, interference, diffraction, polarization, line spectra, and thermal radiation. Prerequisite: PHYS 242.

PHYS-451. Introduction to Astrophysics **Credit 3(3-0)**

This course is a study of radiation from stars and nebulae to determine the basic stellar characteristics, the composition and physical conditions of matter in and between the stars. It also investigates the structural properties of our Milky Way galaxy, as evidenced by the spatial distribution of dust, gas, stars, and magnetic fields. Prerequisite: PHYS 242.

PHYS-457. Electromagnetism III **Credit 3(3-0)**

This course is an extended study of electromagnetism which covers simple radiating systems, multi-pole radiation, and radiation by moving charges, and relativistic kinematics. Prerequisite: PHYS 416.

PHYS-465. Atomic, Molecular, & Laser Physics **Credit 3(3-0)**

This is a study of one-electron atoms, interaction, of one-electron atoms, molecular structure, molecular spectra, emission, absorption and rate equations, laser oscillations, multi-mode and transient oscillations, specific lasers, laser resonators, and laser applications. Prerequisite: PHYS 406.

PHYS-467. Solid State Physics**Credit 3(3-0)**

This is a study of the basics of the topics of binding, crystal structure, the reciprocal lattice, phonons, free and nearly free electron gas models, energy bands, metals semiconductors, insulators, super-conductors, and magnetic properties. Prerequisite: PHYS 406.

PHYS-468. Nuclear Physics and Elementary Particles**Credit 3(3-0)**

This is a study of the properties of the nucleus, radioactivity, nuclear reactions, fission and fusion, elementary particles, and particle accelerators. Prerequisite: PHYS 406.

PHYS-500. Special Topics in Physics**Variable Credit (1-3)**

A junior-senior level course on selected topics in physics not covered in other courses. A descriptive title, syllabus and the amount of credit will have received departmental approval before scheduling. Students records will carry both course number and descriptive title. The course may be repeated to earn a maximum of six credits.

PHYS-510. Physics Seminar**Variable Credit 1-3**

This is a study of current developments in physics. The topics and the amount of credit will be determined before the beginning of the course. Prerequisite: Senior Standing.

PHYS-520. Advanced Laboratory**Credit 2(1-3)**

This is a laboratory course which emphasizes performing selected experiments in classical mechanics, electromagnetism, optics, and atomic, nuclear and condensed matter physics. This course may be repeated to earn a maximum of four credits. Prerequisite: PHYS 242.

PHYS-530. Computational Techniques in Physics**Credit 3(2-3)**

This course is an application of numerical methods to solve problems in physics. It includes root finding, systems of equations, integration, differentiation, boundary-value problems, and Monte Carlo methods. Prerequisite: PHYS 405.

PHYS-531. Experimental Physics**Credit 3(2-3)**

This course surveys experimental methods in physics. It involves experiment development, including techniques in instrumentation design, and data acquisition. Also it involves oral and written presentations of experimental results. Prerequisite: PHYS 242.

PHYS-550. Undergraduate Research**Variable Credit 1-3**

This course involves student participation in research conducted by faculty. Topics may be analytical and/or experimental and encourage independent study. The amount of credit will be determined before the beginning of the course. Prerequisite: Consent of Instructor.

Advanced Undergraduate and Graduate**PHYS-600. Physical Mechanics****Credit 3(3-0)****PHYS-605. Mathematical Methods****Credit 3(3-0)****PHYS-615. Electromagnetic Theory I****Credit 3(3-0)****PHYS-620. Quantum Mechanics I****Credit 3(3-0)****PHYS-630. Statistical Mechanics****Credit 3(3-0)****PHYS-715. Electromagnetic Theory II****Credit 3(3-0)****PHYS-720. Quantum Mechanics II****Credit 3(3-0)****PHYS-730. Optical Properties of Matter****Credit 3(3-0)****PHYS-735. Atomic & Molecular Physics****Credit 3(3-0)****PHYS-737. Physics of Solids****Credit 3(3-0)****PHYS-738. Nuclear Physics****Credit 3(3-0)****PHYS-739. High Energy Physics****Credit 3(3-0)**

PHYS-740. Graduate Seminar	Variable Credit 1-3
PHYS-743. Experimental Methods in Physics	Credit 3(2-3)
PHYS-745. Computational Physics	Credit 3(2-3)
PHYS-750. Relativistic Quantum Mechanics I	Credit 3(3-0)
PHYS-751. Relativistic Quantum Mechanics II	Credit 3(3-0)
PHYS-760. Special Topics	Variable Credit 1-3
PHYS-770. Research	Variable Credit 1-9

PROFESSIONAL TEACHERS PROGRAM

PHYS-705. Physics for Science Teachers I	Variable Credit 1-6
For inservice teachers. Course covers fundamentals of astronomy and earth science. Full descriptive title, syllabus and the amount of credit will have received departmental approval before scheduling. Prerequisite: MATH 111 or equivalent.	
PHYS-706. Physics for Science Teachers II	Variable Credit 1-6
For inservice teachers. Lecture and integrated lab study of the fundamental principles of mechanics, thermodynamics, wave motion, electricity and magnetism, optics and modern physics. Full descriptive title, syllabus and the amount of credit will have received departmental approval before scheduling. Focus: Mechanics and Thermodynamics. Prerequisite: MATH 111 or equivalent.	
PHYS-707. Physics for Science Teachers III	Variable Credit 1-6
A continuation of PHYS 706. Focus: Wave motion and electricity and magnetism. Prerequisite: PHYS 706 or equivalent.	
PHYS-708. Physics for Science Teachers IV	Variable Credit 1-6
A continuation of PHYS 707. Focus: Optics and modern physics. Prerequisite: PHYS 707 or equivalent.	
PHYS-709. Physics for Science Teachers V	Variable Credit (1-6)
A continuation of PHYS 708. Focus: Modern Physics. Prerequisite: PHYS 708 or equivalent.	

DIRECTORY OF FACULTY

Mahjoub A. Abdelgadir, B.S., University of Khartoum; Ph.D., University of Reading; Adjunct Assistant Professor

Abdirahman Y. Abokor, B.S., Somali National University; M.S., Howard University; Ph.D., Texas Tech University; Adjunct Assistant Professor

Stuart T. Ahrens, B.S., Beloit College; M.S., Ph.D., University of Wyoming; Associate Professor

Shelton Y. Beedoe, B.S., University of Liberia; M.S., Ph.D., University of California at L.A., Solomon Professor.

Solomon Bililign, B.S., M.S., Addis Ababa University; Ph.D., University of Iowa; Assistant Professor

Samuel S. Danagouliau, M.S., Yerevan State University; Ph.D., Yerevan Physics Institute; Adjunct Associate Professor

Caesar R. Jackson, B.S., Florida A&M University; M.S., University of Florida; Ph.D., N.C. State University; Assistant Professor and Chairperson

Floyd J. James, B.S., M.S., University of North Carolina; Ph.D., University of N.C. at Chapel Hill, Associate Professor.

Abebe B. Kebede, B.S., Addis Ababa University; M.S., Temple University; Ph.D. Temple University; Assistant Professor

Sekazi K. Mtingwa, B.S., Massachusetts Institute of Technology; M.S. and Ph.D., Princeton University; Professor

Thomas R. Sandin, B.S., Santa Clara University; M.S., Ph.D., Purdue University; Professor

Elvira S. Williams, B.S., North Carolina Central University; M.S., Ph.D., Howard University; Associate Professor

Department of Political Science

Amarjit Singh, Chairperson

OBJECTIVES

The purpose of the Department is to provide students with the basic knowledge of theories, institutions, and processes of politics and public policy. The objectives are: 1) *to develop* an understanding of the operation of government at various levels, 2) encourage students *to engage* in critical discourse of political and social issues, and 3) *to prepare* students for advanced study.

The Department of Political Science offers courses in the following fields: American Government, Political Theory, Public Policy, Research Methodology, International Relations, and Public Administration.

The Department has developed a Microcomputer Laboratory with the initial funds provided by the US Department of Education and subsequently supplemented by the departmental resources for additional hardware and software needs. The Department also shares with the other social science departments the Social Science Microcomputer Laboratory.

Political Science majors are required to take courses which incorporate computer technology to develop their skills in problem solving, quantitative research methods, and to meet the Departmental Requirements for Computer Literacy.

DEGREE OFFERED

Political Science—B.A.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program in the Department of Political Science is based upon the general admission requirement of the University.

DEPARTMENTAL REQUIREMENTS

The major in political science must complete 124 semester hours of University courses. Included in the 124 semester hours are 35 hours of political science courses and 12 hours in a cognate area. A minimum grade of "C" must be attained in the major courses.

Students desiring to minor in political science must complete 18 semester hours in political science including POLI 200 and 210.

CAREER OPPORTUNITIES

A degree in political science prepares students for careers in government, public administration, law (for those continuing to law school), business, industry, foreign service, and leadership in civic and political activities.

CURRICULUM GUIDE FOR THE MAJOR IN POLITICAL SCIENCE

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101 or 111	3	MATH 102 or 112	3
HIST 100	3	HIST 101	3
PHED 200	2	BIOL 100	4
POLI 1001	2	POLI 210 ¹	<u>3</u>
POLI 2001	<u>3</u>		16
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA	3	FOLA	3
CHEM 100 or PHYS 101	4/3	SOCI 302	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	PHIL 260/262	3
POLI Elective	<u>3</u>	POLI 340 ¹	3
	16/15	POLI Elective	<u>3</u>
			18

Junior

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
POLI 333 ¹	3	POLI 334 ¹	3
POLI 440 ¹	3	POLI Elective	3
ECON 300	3	POLI Elective	3
PSYC 320	3	ECON 301	3
African American Studies	3	African American Studies	3
Cognate Area Elective ²	<u>3</u>	Cognate Area Elective ²	<u>3</u>
	18		18

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
POLI Elective	3	Cognate Area Elective ²	3
Cognate Area Elective ²	3	Free Elective	<u>7/8</u>
POLI Internship (Free Elective) ³	3		10/11
Global Studies	<u>3</u>		
	12		

Total Credit Hours: 124-126

¹ *REQUIRED POLITICAL SCIENCE COURSES*

² *Students are advised to choose their cognate area requirement of twelve (12) credit hours from one of the following disciplines: ENGL, TRAN, ECON, ACCT, BUAD, COMM, HIST, or AFRICAN STUDIES. (100 level courses will not be accepted to meet the cognate area requirement.)*

³ *POLI Internship credit will not be accepted to meet the major requirement of thirty-five (35) credit hours.*

COURSES AND DESCRIPTION FOR POLITICAL SCIENCE

Undergraduate

POLI-100. Orientation to Political Science **Credit 2(1-2)**

An introduction to the Department and the major for freshmen and transfer students; administrative organization, faculty specialties, library and other learning resources; scope of the discipline, concentration areas, major, minor and cognate requirements, information concerning graduate schools, law schools, and employment opportunities. Also included is computer training to meet the minimum departmental requirements for computer literacy.

POLI-200. American Government and Politics **Credit 3(3-0)**

This course introduces the student to the study of politics through an analysis of major features of the American polity. Topics to be treated include the political self-understanding of Americans, the founding of the political system, the operation of our political institutions, and the forms of political participation.

POLI-210. State and Local Government **Credit 3(3-0)**

A study of the structure and functions of state and local government in the United States and their relationship within the federal system. Special consideration is given to contemporary problems.

POLI-220. Blacks in the American Political System **Credit 3(3-0)**

This course is designed primarily to facilitate the development of a frame of reference which will make it possible for students to organize and interpret political phenomena involving Black people living in the United States. Special emphasis is placed on understanding the Black predicament in this country, causes and changes.

POLI-250. Introduction to Public Policy **Credit 3(3-0)**

The course is designed to provide the student with basic knowledge of public policy. Students will survey the approaches and methods of policy studies, contemporary policy issues, and future considerations of public policies.

POLI-310. Comparative Politics **Credit 3(3-0)**

A survey of the politics and governments of selected political systems highlighting their commonalities and particularities. Special consideration is given to aspects of political development.

POLI-333. Political Research Methods I **Credit 3(3-0)**

Introduces students to fundamental methods and procedures in the collecting and analyzing of political data. Research on a specific political subject is required.

POLI-334. Political Research Methods II **Credit 3(3-0)**

A continuation of Political Research Methods I, focussing on data analysis, interpretation and computer utilization.

POLI-340. Public Administration (Formerly Pol. Sci., 443) **Credit 3(3-0)**

Emphasis is devoted to basic principles of organization, location of authority, fiscal management, personnel management, forms of administrative action in the public service, technological and managerial advancements.

POLI-350. Public Personnel Administration **Credit 3(3-0)**

The course focuses on the theory and practice of public personnel administration with emphasis on public personnel selection, training, classification, compensation, promotion and human relations.

POLI-400. Mass Political Attitudes and Behavior **Credit 3(3-0)**

A study of mass political attitudes and their expression in various forms of political activity. Topics include opinion and democratic theory; social, psychological and institutional influences on political behavior; opinion measurement and mass movements.

POLI-410. Public Policy and Technology **Credit 3(3-0)**

This course is designed primarily for students in sciences and engineering; however, it does not exclude students in other disciplines, especially, business and economics. Students will study the social, economic, human, and environmental impact of technological development. The role of scientists and technologists in selected policy choices will be examined.

POLI-420. Public Budgeting **Credit 3(3-0)**

The course deals with the evolution, process, and impact of public budgeting. Special attention is given to the purpose, models, reforms and key factors involved. Budgeting is viewed from the federal, state and local levels.

POLI-430. Policy Analysis **Credit 3(3-0)**

An introduction to the foundation and methods of policy analysis. Statistical and economic methods are presented with case studies.

POLI-440. Political Theory **Credit 3(3-0)**

An in-depth treatment of the growth and development of this area of Political Science and its relevance to the field. The approach considers ancient medieval thought as a unit and modern political thought as a separate unit.

POLI-444. International Relations **Credit 3(3-0)**

A comprehensive treatment of the policies and politics of nations; imperialism, colonialism, balance of power, international morality, treaties, sovereignty, diplomacy, tariff, war and other arrangements. Prerequisite: POLI 200.

POLI-445. Problems of Contemporary Africa **Credit 3(3-0)**

Consideration of liberation struggles, decolonization and the emerging of independent states, and efforts toward Pan-Africanism since World War II.

POLI-448. Politics of Transportation **Credit 3(3-0)**

Analysis of political roots of various transportation problems such as highway location issues, mass transit bond issues, and politics of transportation innovation. The working mechanisms of federal, state and local transportation related units will also be considered. Case studies of local, regional and national issues will be included. Prerequisite: Junior status.

POLI-499. Internship I **Credit 3(0-10)**

Supervised internship in public and private agencies for political science majors. Prerequisites: POLI 200, 210.

POLI-504. Independent Study **Credit 3(3-0)**

Senior Political Science majors who have exhibited facility for independent study and attained a minimum grade point average of 3.0 in their major may arrange to investigate an area not covered in the regular curriculum. Permission of the supervising instructor and the Department Chairperson is required.

- POLI-505. Honors Seminar in Political Science** **Credit 3(3-0)**
For superior students (seniors). A thorough examination of selected political works, primarily paperbacks. A treatment of selected political philosophies and ideas for informal discussion. Several critical reviews will be required.
- POLI-541. Party Politics and Pressure Groups** **Credit 3(3-0)**
This course deals with modern political parties in the United States as instruments of popular government. Special emphasis is placed upon party structure, functions and operations as it relates to the African American. Prerequisite: POLI 200.
- POLI-542. American Constitutional Law** **Credit 3(3-0)**
A case study of major Supreme Court Decisions, the Judiciary, the Congress, the President, the Federal System, the First Amendment Freedoms and Due Process Rights.
- POLI-543. Civil Liberties** **Credit 3(3-0)**
A study of major Supreme Court decisions interpreting the Bill of Rights (the First Ten Amendments) and the subsequent amendments dealing with freedom and equality. Ruling of the Warren and Burger Courts will be given special attention. Prerequisite: Advanced Standing (Juniors and Seniors only).
- POLI-544. International Organization** **Credit 3(3-0)**
This course analyzes the role of the international organization in world politics. Particular emphasis is given to the various approaches of international organizations in fostering peace and economic and social cooperation. Some attention will be given to the United Nations system as well as such defense, political, and economic arrangements as NATO, OAS, SEATO and the European Communities.
- POLI-599. Internship II** **Credit 3(3-30)**
This course is designed to expose Political Science majors to the actual environment of political processes, management, and public policy through supervised work experience. Prerequisites: Pol. Sci. 200, 210, 333, 340. (Recommended for summer internship.)

Advanced Undergraduate and Graduate

- POLI-604. Directed Study/Research** **Credit 3(3-0)**
Directed study or research on a specific topic in political science.
- POLI-640. Federal Government** **Credit 3(3-0)**
After a brief review of the structure and functions of the federal government, this course concerns itself with special areas of federal government: problems of national defense, the government as a promoter, the government as regulator, etc. Students will engage in in-depth study in one of the specific areas under consideration.
- POLI-641. Seminar in State Political Problems** **Credit 3(3-0)**
An in-depth study of special problems connected with operations of state and local governments.
- POLI-642. Modern Political Theory** **Credit 3(3-0)**
Includes selected political works for adherence to modern conceptions of the state, political institutions as well as the works of Machiavelli, Hobbes, Spinoza, Rousseau, Burke, Mill, Hegel, Marx, and Dewey.
- POLI-643. Urban Politics and Government** **Credit 3(3-0)**
A detailed analysis of the urban political arena including political machinery, economic forces and political structures of local governmental units.
- POLI-644. International Law (Formerly Pol. Sci. 543)** **Credit 3(3-0)**
A study of the major principles and practices in the development of the Law of Nations, utilizing significant cases for purposes of clarification. Prerequisites: POLI 200, 444.

POLI-645. American Foreign Policy—1945 to present **Credit 3(3-0)**
Examination of forces and politics that have emerged from Potsdam, Yalta, and World War II. Emphasis will be on understanding the policies that were formulated, why they were formulated, the consequences of their formulation, and the alternative policies that may have come about. Prerequisites: Survey course in American History, American Diplomatic History, and consent of instructor.

POLI-646. The Politics of Developing Nations **Credit 3(3-0)**
Political structures and administrative practices of selected countries in Africa, Latin America, Asia, analysis of particular cultural, social and economic variables peculiar to the nations.

POLI-653. Urban Problems **Credit 3(3-0)**
Analysis of some of the major problems in contemporary urban America. The course includes an examination of their causes, effects and possible solutions.

DIRECTORY OF FACULTY

Claude W. Barnes, Jr., B.A., North Carolina A&T State University; M.A., Atlanta University; Ph.D., Clark Atlanta University; Assistant Professor

Samuel A. Moseley, B.A., North Carolina A&T State University; M.A., Ph.D., Ohio State University; Assistant Professor

Phung Nguyen, B.A., M.A., National School of Administration, Saigon; M.B.A., Dalat University, Saigon; M.A., Ph.D., Duke University; Associate Professor

Benjamin Rawlins, B.S., Johnson C. Smith University; M.P.A., University of North Carolina at Chapel Hill; J.D., Georgetown University; Adjunct Assistant Professor

Amarjit Singh, B.A., Punjab University; LL.B., University of Delhi; M.I.S., Ph.D., Claremont Graduate School; Professor and Chairperson

James D. Steele, B. A., Morgan State University; M.A., Ph.D., Atlanta University; Assistant Professor

Paula E. Young, B.A., Memphis State University; M.P.A., Clark Atlanta University; Ph.D., University of Cincinnati; Assistant Professor

Department of Psychology

George S. Robinson, Chairperson

OBJECTIVES

The objectives of the Department of Psychology are consistent with the objectives of the College of Arts and Sciences. In general, the Department of Psychology serves the University by offering the undergraduate major in psychology and by providing service courses for other departments. In addition, the Department prepares students for graduate study in psychology and associated fields and provides students with skills related to employment at the baccalaureate level.

DEGREE OFFERED

Psychology—B.A.

DEPARTMENTAL REQUIREMENTS

Psychology major—The major in psychology must complete 124 semester hours of University courses. Included in the 124 semester hours are 55 hours of general education requirements, 47 hours of psychology courses, and 22 hours of free electives.

The Minor in Psychology—Students desiring to minor in psychology must complete PSYC 320, PSYC 242, PSYC 322, and an additional 15 semester hours in psychology.

CAREER OPPORTUNITIES

To function as a professional psychologist, it is necessary to complete graduate training in the discipline. However, the baccalaureate degree can lead to career and job opportunities in child care, human and social services, military services, law enforcement and criminal justice, and mental health services, to name a few.

CURRICULUM GUIDE FOR THE MAJOR IN PSYCHOLOGY

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 100	4	CHEM 100	3
ENGL 100	3	CHEM 110	1
HIST 100	3	ENGL 101	3
MATH 101	3	PSYC 320	3
PSYC 242	3	MATH 102	3
	<u>16</u>	HIST 101	<u>3</u>
			16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA	3	FOLA	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	PHED 200	2
PSYC 322	4	PSYC 325 or PSYC Elective	3
PSYC 324	3	PSYC 440	4
	<u>16</u>		<u>15</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PSYC 420	3	BIOL 461	4
SOCI 100	3	PSYC 439	3
Elective (Humanities)	3	PSYC 434	3
PSYC Elective	3	Free Electives	5
Free Electives	3	PHED 102	1
PHED 101	1		<u>16</u>
	<u>16</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PSYC 542	3	PSYC 540, 541 or 550	3
Free Electives	9	Free Electives	5
PSYC 526 or PSYC Elective	3	PSYC Elective	3
	<u>15</u>	PSYC 544	<u>3</u>
			14

Total Credit Hours: 124

COURSES WITH DESCRIPTION FOR PSYCHOLOGY

PSYC-242. Information Processing Techniques in Behavioral Research Credit 3(2-2)

An exploration of the ability of computers to assist in behavioral research. Included are literature review (bibliographic search), stimulus presentation and response recording (programming and data management), data analysis (spreadsheets and statistical packages), data presentation (graphics), and report writing (word processing).

PSYC-320. General Psychology

Credit 3(3-0)

An introduction to psychology as a life science especially designed for the major in areas other than psychology. Topics given major consideration include maturation and development- motivation, emotion, and personality; mental health, intelligence and aptitude; perception and attention; learning, forgetting, language, and thinking; social influence, attitudes, and beliefs, and vocational adjustment.

PSYC-321. Elementary Psychology

Credit 3(3-0)

An introduction to psychology as a behavioral science required of the major in psychology with enrollment restricted to such majors. Majors areas of consideration include maturation and development, nervous system and internal environment; physiological basis of behavior; motivation, emotion, and personality; and psychological testing.

PSYC-322. Statistical Methods

Credit 4(3-2)

Analysis and interpretation of research data. Descriptive statistics (frequency distributions, centrality, variability, and correlation of measures), introduction to statistical inferences (normal curve sampling theory, chi square tests of statistical hypotheses, t-tests, analysis of variance). Prerequisite: PSYC 242.

PSYC-324. Developmental Psychology I (Child)

Credit 3(2-2)

A comprehensive study of the physical, social, emotional, personality, language, and intellectual development of the child from birth through early childhood. [Fall]

PSYC-325. Developmental Psychology II (Adol.)

Credit 3(3-0)

A study of behavior during the culturally and biologically produced transition period between childhood and adulthood. Emphasis is on the variety of alternative adjustments that are being made. Aspects of behavior include physical, cognitive, friendships, family, identification, sexuality, hazards to well being, schools and curriculum, and moral development.

PSYC-420. Social Psychology

Credit 3(3-0)

An introduction to the study of the behavior of the individual in relation to factors in his social environment. Socialization, enculturation, attitude formation and modification, social influence on perceptual and conceptual processes, and social interaction.

PSYC-434. Abnormal Psychology

Credit 3(3-0)

Behavior deviations and psychological disorders occurring during the several developmental stages; basic concepts employed in psychopathology, mental hygiene, and psychiatry.

PSYC-439. Theories of Personality**Credit 3(3-0)**

Contemporary theoretical formulations of the structure and development of personality and their empirical bases.

PSYC-440. Introduction to Psychological Research**Credit 4(3-2)**

A survey of various research methods with an emphasis on experimental design, instrumentation, and the collection, analysis, interpretation, and reporting of research data. Prerequisite: PSYC 322 or equivalent.

PSYC-445. Industrial Psychology**Credit 3(2-2)**

A consideration of the significance of individual differences in industry- employee selection and training- reduction of monotony and fatigue and the promotion of efficiency; accident prevention; psychological factors in employee turnovers.

PSYC-500. Independent Study**Credit 3-6**

Independent study on a specific topic or area in behavioral science. Prerequisite: Permission of the instructor.

PSYC-526. Developmental Psychology III (Adult)**Credit 3(3-0)**

A study of those psychological processes of development occurring from the end of adolescence and extending through the life span, thus including early, middle, and late adulthood and senescence or old age. Considerations will be given to physical, cognitive, and social aspects, sex, personality traits, change of lives, retirement, and the process of aging.

PSYC-540. Physiological Psychology**Credit 3(2-2)**

A study of the physiological and chemical processes (and their anatomical substrates) that intervene between the arrival of sensory impulses in the central nervous system and the elaboration of responses to them. Prerequisite: BIOL 461.

PSYC-541. Human Learning and Cognition**Credit 3(3-0)**

An exploration of general principles of learning and memory along with their practical applications. Coverage will include simple (conditioning) to complex (thinking and problem solving) aspects of human behavior and cognitive activity with data and interpretations from several points of view presented.

PSYC-542. Seminar in Psychology**Credit 3(3-0)**

A study of selected major systematic views and theoretical issues in psychology. Each student participates in supervised research in psychological journals and other materials leading to an oral presentation and written paper on a substantive view or issue in psychology.

PSYC-544. Psychological Testing**Credit 3(2-2)**

Emphasizes the principles of measurement of psychological attributes; an examination of factors essential for a reliable and valid measuring instrument with an emphasis on the important role they play in producing their effects. There will be discussion and preclinical experiences with the more valid tests available in the areas of personality, aptitude, attitude, interests and intelligence testing. Prerequisite: PSYC 322. [Spring]

PSYC-545. History and System in Psychology**Credit 3(3-0)**

A survey of the philosophical and scientific origins of contemporary theories of behavior including consideration of the schools and systems of thought which have emerged.

PSYC-550. Psychology of Animal Behavior**Credit 3(3-0)**

A study of various types of animal behaviors such as communication, aggression, feeding, sexual behavior, maternal behavior, territoriality, socialization, learning processes, and responses to stressors, and how heredity and environment affect these behaviors, with emphasis on domestic animals and their often "unnatural" environment. Prerequisite: At least junior standing.

PSYC-644. Applied Health Psychology**Credit 3(2-2)**

The utilization of psychology concerning the diagnosis, treatment, and prevention of physical disorder (e.g. hypertension) and disease from a behavioral and/or psychological perspective. Prerequisite: Junior or senior standing or permission of the instructor. [Fall]

PSYC-645. Behavior Modification**Credit 3(3-0)**

A survey of relevant research and techniques making use of either learning theory or behavior principles in the treatment of deviant behavior. Special emphasis is placed on the use of operant conditioning procedures in the prevention and treatment of abnormal behavior.

DIRECTORY OF FACULTY

Cecil H. McManus, B.S., Western Carolina University; M.A., North Carolina State University; Ph.D., Howard University; Assistant Professor

William A. Reed, Jr., B.S., N.C. A&T State University; M.A., Hampton University; Ph.D., Atlanta University; Assistant Professor

Susan Schumacher, B.A., Roanoke College; M.A., Hollins College; Ph.D., The University of North Carolina at Greensboro; Associate Professor

Sarla Sharma, B.A., Banaras Hindu University; M.A., The University of Chicago; Ed.D., The University of North Carolina at Greensboro; Professor

George S. Robinson, B.A., N.C. A&T State University; Ph.D., The University of North Carolina at Chapel Hill; Associate Professor and Chairperson.

Department of Sociology and Social Work

Sarah V. Kirk, Chairperson

OBJECTIVES**The objectives of the Social Work Program are:**

- 1) to prepare social work students for employment at the baccalaureate level
- 2) to prepare students for postbaccalaureate study,
- 3) to provide courses for employed social work personnel who wish to upgrade their social competencies in the delivery of services. This group includes those seeking certification in school social work as well as those persons, who though employed may have less than a baccalaureate degree, and
- 4) to provide selected social work courses for non-social work majors.

The objectives of the Sociology Program are:

- 1) to provide students with analytic and systematic skills necessary to understand the problems inherent in societal relationships and to subsequently attempt to solve them,
- 2) to prepare students for education,
- 3) to prepare students for human services careers, as well as in research and/or teaching, and
- 4) to provide courses for the liberal arts curriculum.

DEGREES OFFERED

Sociology—B.A.

Bachelor of Social Work—B.S.W.

GENERAL PROGRAM REQUIREMENTS

Students are admitted to the department on the basis of general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Sociology Major—Completion of a minimum of 124 semester hours of University courses. Included in the 124 semester hours are 46 hours of Sociology. A minimum grade of "C" must be achieved in these courses. Sociology majors are required to complete an 18 hour concentration.

Social Work Major—Completion of a minimum of 124 semester hours of University courses. Included in the 124 semester hours are 41 semester hours of Social Work. A minimum grade of "C" must be achieved in major courses. Social Work majors are required to take 21 hours in Sociology.

Certification in School Social Work requires completion of the Social Work Curriculum plus 9-12 additional hours in Social Work and 5-6 additional hours in Education. A minimum grade of "C" must be achieved in major courses. All English courses require a minimum grade of "C."

Anthropology concentration requires 18 hours.

CAREER OPPORTUNITIES

A degree in Social Work provides students with the competencies essential for immediate entry as a generalist into the professional field of Social Work. Career opportunities include but are not limited to departments of social services, school social work, mental health agencies and the criminal justice system.

A degree in Sociology is preparatory for graduate study in Sociology and can serve as the basic preparation for study of law, social work and public administration, entry into government service positions, applied research and education. The Social Work Program is accredited by the Council on Social Work Education and in cooperation with the School of Education is authorized to recommend candidates for Baccalaureate Certification in School Social Work.

CURRICULUM GUIDE FOR THE MAJOR IN SOCIOLOGY

Freshman Year			
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 100	3	ENGL 101	3
HIST 101	3	*MATH 102	3
MATH 101	3	BIOL 100	4
(100 if remedial needed)		SOCI 101	3
ENGL 100	3	SPCH 250	<u>3</u>
BUED 301	2		16
PHED 200	2		
FRST 100	<u>1</u>		
	17		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
EASC 201	3	FOLA	3
FOLA	3	SOCI 314 or HIST Course	3
SOCI 302	3	SOCI 204	3
Free Elective	3	SOCI 303	3
HIST 262	3	SOCI 301	<u>3</u>
SOCI Elective	<u>3</u>		15
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 402	3	American, English or African	
ENGL 300	3	American	3
SOCI 300	3	SOCI 308 or 501	3
Concentration	<u>6</u>	SOCI 403	3
	15	Concentration	<u>6</u>
			15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 671	3	SOWK 570	1
SOCI 406 or 503	3	Concentration	3
Concentration	3	SOWK 674	3
Free Electives	4	SOCI 673	3
SOWK 669 or 670	<u>3</u>	SOWK/SOCI Elect./Free Elec.	<u>6</u>
	16		16

Total Credit Hours: 128

**This course includes the program's comprehensive exam.*

Concentration: Eighteen hours in Transportation, Economics, History, Mass Communication, Psychology, Political Science, Computer Science, Business Administration, Biology, Anthropology, Public Relations or Social Work which requires 68 hours, but qualifies you for a second degree. The 18 hours must be passed with grade of "C" or better, as well as each major course and all English courses.

CURRICULUM GUIDE FOR THE MAJOR IN SOCIAL WORK

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
SOCI 100	3	MATH 102	3
HIST 101	3	BIOL 100	4
MATH 101	3	POLI 200 or ECON 300	3
(100 if remedial needed)		SOCI 101	<u>3</u>
SOWK 133*	3		16
FRST 100	<u>1</u>		
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
EASC 201	3	SOWK 333	3
SOCI 302	3	SPCH 250	3
FOLA	3	PSYC 324	3
PSYC 320	3	FOLA	3
PHED 200	2	SOCI 204	3
POLI 210 or ECON 301	3	Free Electives	3
	<u>17</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 300	3	SOCI 402	3
SOCI 301	3	SOCI 314 or African American	
HIST 262	3	History Course	3
SOWK 210	3	SOWK 306	3
SOWK Elective	3	POLI 340 or BUAD 422/350	3
	<u>15</u>	American, English or African	
		American Literature	3
		SOWK Elective	3
			<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOWK 307	5	SOWK 520	5
SOWK 334	3	SOWK 571	3
SOCI 403	3	SOCI 674	3
Free Elective	2	SOWK 570**	1
	<u>13</u>	SOWK Elective	3
			<u>15</u>

Total Credit Hours: 128

**This course must be successfully completed prior to enrolling in any other Social Work courses.*

***This course includes the program's comprehensive exam.*

All transfer social work credits must come from a CSWE accredited program.

COURSES WITH DESCRIPTION FOR SOCIOLOGY AND SOCIAL WORK

SOCIOLOGY

SOCI-100. Principles of Sociology

Credit 3(3-0)

Basic concepts and principles in Sociology as they are used to examine patterned and recurrent forms of social behavior.

SOCI-101. Basic Quantitative Writing and Computer Skills in Sociology

Credit 3(3-0)

This course, to be taken concurrently with SOCI-100—Principles of Sociology, is designed to provide students with basic computer skills needed to summarize and describe sociological data. The ability to perform elementary calculations, such as percentages, proportions,

and ratios, along with utilization of graphing techniques is a prime objective. Other descriptive/summary statistical techniques emphasized include construction and interpretation of one- and two-variable tables. A third objective is to ensure that students can write a clear report in standard English on the methods and findings of elementary research.

SOCI-204. Social Problems

Credit 3(3-0)

Major social problems in American society and their relationship to social structures. Prerequisite: SOCI 100, concurrent, Statistics I.

SOCI-301. Origins of Social Thought

Credit 3(3-0)

Review of the major historical sources, nature and growth of social thought. An introduction to the emergence of Sociological Theory in Europe and America in the 19th and early 20th centuries.

SOCI-302. Social Statistics I

Credit 3(3-2)

An introduction to elementary statistical reasoning, descriptive statistics, frequency distribution, graphics, measures of central tendency and dispersion. Correlation and regression techniques are also taught.

SOCI-303. Social Statistics II

Credit 3

Inferential statistics, probability, sampling distribution tests of significance as well as measures of association, analysis of variance, multivariate correlational analysis are taught. Prerequisite: SOCI 302.

SOCI-304. Social Aspects of Human Sexuality

Credit 3(3-0)

Social aspects of human sexuality. American sexual behavior and its influence on life styles. Emphasis will be on social roles.

SOCI-305. Reading for Honors in Sociology

Credit 3(3-0)

Intensive and extensive library research on topics in Sociology. Prerequisite: "B" average.

SOCI-308. The Family

Credit 3(3-0)

The family as a social institution, and family types in cross cultural perspectives.

SOWK-312. Major Problems of Family Functioning

Credit 3(3-0)

This course examines the dynamics of families experiencing major dysfunctions related to poverty, violence, the effects of deviant family members, and the social programs and policies relating to these problem areas. This course will enhance the student's social work practice with families by increasing understanding of dysfunctional effects of these problems on the family system and its individual members and the relationship of policies and programs to the enhancement or deterioration of family life.

SOWK-313. The Community

Credit 3(3-0)

A study of the social areas commonly defined as communities, and analyses of the social processes that occur within their boundaries. Community organization skills are taught as a vehicle to address social ills.

SOWK-323. Introduction to Family Therapy

Credit 3(3-0)

Designed to introduce the student to the rapidly developing field of family therapy. A brief overview of family therapy will be presented, along with explanation of the similarities and the difference with other therapies. Several models of practices and technique will be presented. Prerequisites: SOCI 308, SOCI 312, SOCI 334.

SOCI-402. Social Theories

Credit 3(3-0)

Social thought and theory in its development from Comte to the present. Prerequisite: SOCI 302.

SOCI-403. Social Research Method I.**Credit 3**

Introductory course in social research methods; basic theory, principles and practical applications of data collection, analysis and interpretation. Includes study of research designs, measurement techniques, and sampling techniques used in survey research methods.

SOCI-406. Criminology**Credit 3(3-0)**

Genesis and origin of crime and an analysis of theories of criminal behavior.

SOCI-408. Independent Study I**Credit 3(3-9)**

Independent research on a specific topic or a delineated area in Sociology. Prerequisite: Permission of the instructor.

SOCI-501. Social Stratification**Credit 3(3-0)**

A study of social inequalities and differentiation as related to social structures and social systems. Prerequisite: SOCI 302.

SOWK-503. Juvenile Delinquency**Credit 3(3-0)**

Sociological and psychological explanation relative to the causes and rehabilitation of juvenile delinquents, probation and treatment of juveniles within the criminal justice system.

SOCI-570. Senior Seminar

Research and discussions of professional and field issues related to Sociology and Social Work. Prerequisite: Senior standing.

SOCI-671. Research Methods II**Credit 3(3-0)**

Continuation of SOCI 403. Prerequisite: Senior or graduate standing; minimum of 6 to 9 credits in statistics and research.

SOCI-672. Selected Issues in Sociology**Credit 3(3-0)**

Topics of current interest to sociologists and the student body are explored.

SOCI-673. Introduction to Population Studies**Credit 3**

Overview of demographic processes; growth, fertility, mortality and migration in human populations. Focus on causes and consequences of demographic change in relation to social change and economic development.

SOWK-674. Evaluation of Social Programs**Credit 3**

Main focus on evaluative research methodology; research designs, measurement of program effectiveness and cost effectiveness analysis. Includes case studies of needs assessment, program monitoring and impact measurement in human services. Prerequisite: Social Statistic (S302) and Research Methods (S403).

SOCIAL WORK**SOWK-133. Social Professions, Fields and Services****Credit 3(2-2)**

Course is designed to introduce students to the human services professions with emphasis on Social Work as a profession. It explores the human service professions from historical, sociological, political, and economic viewpoints.

SOWK-210. Professional Relationship Skills**Credit 3(3-0)**

This course is designed to provide the student with an understanding of the effective dimensions present in the helping process and an opportunity to learn and practice the skills. The course will be helpful to students entering social work, guidance and counseling, teaching, and nursing. It must be taken prior to field placement for B.S.W. students. Prerequisite: SOWK 133.

SOWK-306. Social Functioning and Human Development **Credit 3(3-0)**

Covers social growth during the life cycle, aspects of communication between people from different cultural backgrounds, and the implications of this growth and communication for service delivery to members of ethnic groups. Prerequisite: SOWK 133.

SOWK-307. Field Instruction I **Credit 5(0-6)**

The first of two practicums in generalist principles and concepts in a human service agency is provided. Agency field instructors carry responsibility for facilitating students' learning. This is accomplished via personal supervision designed to help students integrate theory and practice to develop appropriate skill, knowledge, attitude and professional identity. Taken concurrently with SOWK 334. Students spend two days a week in an agency usually on Tuesdays and Thursdays. Students are also required to participate in a seminar course which meets twice a month usually on Wednesday mornings. This seminar is a part of the field instruction program and is designed to help students integrate their learning experiences.

SOWK-309. Disability and Employment **Credit 3(3-0)**

This course will focus on selected mental, physical, and social disabilities, and their implications for coping and employment.

SOWK-318. Practicum in the Community **Credit 5(0-16)**

Selection of a community problem, study and analysis of the problem followed by corrective activities, when possible. Prerequisite: Consent of the instructor.

SOWK-320. Reading for Honors in Social Welfare **Credit 3(3-0)**

Extensive library research in selected areas of social welfare. Prerequisite: Sophomore standing, "B" average.

SOWK-325. Honors Seminar in Social Service **Credit 3(3-0)**

Selected topics in social welfare are extensively studied and discussed. Prerequisite: Junior standing, "B" average.

SOWK-333. Social Welfare **Credit 3(3-0)**

Social Welfare legislation and policy. Prerequisite: SOWK 133. Students spend a minimum of 40 hours in a social agency.

SOWK-334. Social Work Methods I **Credit 3**

An introduction to the principles of social work practice and to the multiple roles assumed by the generalist social worker. Emphasis is placed on developing basic skills required for effective intervention with individuals, families and small groups. Course content provides for the analysis of interviewing, problem assessment and strategies through experiential exercises. Taken concurrently with SOWK 307. Prerequisites: SOWK 133, 210, 333 and 306.

SOWK-372. Child Welfare I **Credit 3(3-0)**

This course is designed to offer students an opportunity to develop cognitive skills as they relate to the history and development of Child Welfare. Students will review needs of children and evaluate the extent to which parents/society are able to meet their needs.

SOWK-373. Child Welfare II **Credit 3(3-0)**

An examination of philosophies and institutional systems that impact on child welfare. This course will examine influences of such issues as racism, sexism, women's lib, and child advocacy. Major institutions (educational, court/legal, health care, economic, political) will be examined to identify and evaluate effects. Prerequisite: None.

SOWK-374. Institutional Services for Children **Credit 3(3-0)**

A study of the primary resources available for children. Emphasis will be placed on the characteristics of children needing help and the adequacy/inadequacy of community programs.

Attention is given to the cooperative nature of these programs as well as the auspices, standards and policies. Prerequisite: None.

SOWK-520. Field Instruction II

Credit 5

A continuation of knowledge and skill development under the guidance of the agency field director. Students are expected to gradually perform more independently often assuming full responsibility for various agency tasks assigned to them. Students spend two days a week in an agency usually on Tuesdays and Thursdays. Students are also required to participate in a seminar course which meets twice a month usually on Wednesday mornings. This seminar is a part of the field instruction program and is designed to help students integrate their learning experiences. Taken concurrently with SOCI 571.

SOWK-525. Independent Study

Credit 3(0-9)

Independent research in a delineated area of social welfare. Prerequisite: Only Sociology/Social Work Majors and consent of the instructor.

SOWK-570. Senior Seminar

Credit 1(1-0)

Research and discussion of professional and field issues related to careers in Sociology and Social Work. Prerequisite: Senior status.

SOWK-571. Social Work Methods II

Credit 3(3-0)

A continuation of skill development. Emphasis is on social work intervention in larger systems, (organizations, groups and communities.) Attention is given to further understanding the dynamic relationship between people and their environments; the conflicting issues in social work practice, and the impact of various settings on practice. Taken concurrently with SOWK 520.

** Full time social work students are required to register for SOWK 306, 307, 333, and 334 concurrently. Part time students with faculty approval may complete SOWK 306, and 333 prior to registering for 307 and 334.*

ANTHROPOLOGY

SOCI-200. Introduction to Anthropology

Credit 3(3-0)

An analysis and comparison of primitive cultures; further comparisons with modern cultures.

SOCI-300. Topics in Cultural Anthropology

Credit 3(3-0)

Selected topics in language, culture, mythology, and religion designed to acquaint students with analyzing cultural patterning in this and other cultures.

SOCI-420. Human Evolution in Ecological Perspective

Credit 3(3-0)

Examines human cultural and biological evolution using an ecological perspective.

SOCI-603. Introduction to Folklore

Credit 3(3-0)

Basic introduction to the study and appreciation of folklore.

SOCI-650. Independent Study in Anthropology

Credit 3(3-0)

Enables the student to do readings and research in anthropology in cooperation with the instructor.

SOCI-651. Anthropological Experience

Credit 3(2-2)

An exploration of anthropological theories and research methods with an emphasis on qualitative research methods.

SOCI-701. Seminar in Cultural Factors in Communication

Credit 3(3-0)

Course is designed both to sensitize the student to the importance of cultural factors in non-verbal and verbal communication and to equip the student with ways to record and analyze this behavior.

INTRA-DEPARTMENTAL COURSES

SOSW-310. Medical Sociology

Credit 3(3-0)

Sociological analysis of medical services, the role of the sick professional organizations and quasi professional groups; socializational structure of hospitals; sociodemographic and socioepidemiologic variables in relation to modern societies. Cultural and cross-cultural customs and traditions affecting attitudes toward health and the healing art.

SOCI-311. Sociology of Mental Health

Credit 3(3-0)

Sociocultural variation in the assessment of sociopathological and psychopathological aspects of mental disorder. A critical analysis of institutions of mental health care, consideration of the etiology of mental illness, typologies, and social policies relative to the phenomenon of mental health. Prerequisite: SOCI 100.

SOWK-314. Black Experience

Credit 3(3-0)

A topical seminar focusing on commonly shared experiences of American Blacks in selected social institutions. Prerequisite: Junior standing.

SOWK-370. Aging in Society

Credit 3(3-0)

Aging and its implication in social institutions. Prerequisite: Junior standing.

SOWK-515. Independent Study II

Credit 3(0-9)

Prerequisite: Six (6) hours of statistics, and/or research.

SOSW-600. Seminar in Social Planning

Credit 3(3-0)

Personal and social values as related to social planning: "systems" theories program planning and evaluation. Prerequisite: Senior or graduate standing.

SOSW-601. Seminar in Urban Studies

Credit 3(3-0)

An analysis of the nature and problems of cities, urban society and urban development.

SOSW-625. Sociology/Social Service Internship

Credit 5(0-5)

An internship to provide opportunities for students to enhance their employability by supervised experiences in selected agencies.

SOSW-669. Small Groups

Credit 3(3-0)

Elements and characteristics of small group behavior and process. Prerequisite: Senior or graduate standing; or permission of the instructor.

SOSW-670. Law and Society

Credit 3(3-0)

This course examines selected and representative forms of social justice and injustices; barriers to and opportunities for legal redress, as related to contemporary issues. Prerequisite: Senior or graduate standing.

Note: Sociology 100, Sociology 101, Social Work 133, and 302, Sociology 204, Introduction to Anthropology 200, Small Groups-669 and Law and Society-670 are the only courses scheduled to be taught each semester. Other courses are taught once per year and students must follow the curriculum sheet.

DIRECTORY OF FACULTY

Fasihuddin Ahmed, B.A., Forman Christian College; M.A., University of the Punjab; Ph.D., University of Chicago; Associate Professor

Christine Boone, B.A., North Carolina Central University; M.S.W., Rutgers University; D.S.W., Howard University; Associate Professor

Robert Davis, B.A. Southern University; M.A., Atlanta University; Ph.D., Washington State University; Post-Doctoral, University of Wisconsin; Madison; Professor

David Johnson, B.A., Hamilton College, M.A., University of North Carolina at Chapel Hill; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

James Johnson, B.S., North Carolina A&T State University M.S.W., University of North Carolina at Chapel Hill; J.D., North Carolina Central University; Associate Professor

Sarah Kirk, B.A., St. Augustine College; M.S.W., Atlanta University; M.S., University of Pittsburgh; Ph.D., University of Pittsburgh; Associate Professor and Chairperson

Lawrence Shornack, B.A., Rutgers University; M.A., New York University; Ph.D., New York University; Associate Professor

Ruthena Smith, B.S., North Carolina A&T State University; M.S.W., University of Connecticut; Assistant Professor

Wayne Moore, B.S. East Carolina University; M.S.W., Ohio State University; Ph.D., University of South Carolina; Associate Professor.

Velma Turance, B.S., Tuskegee Institute; M.S.W., Fordham University; Assistant Professor

Department of Speech Communication and Theatre Arts

Mary M. Tuggle, Chairperson*

Samuel A. Hay, Interim Chairperson

OBJECTIVES

The objectives of the Department of Speech Communication and Theatre Arts are as follows:

1. To develop students with competence in the total process of speech communication, traditional and contemporary.
2. To develop competent speech and theatre teachers, mass communication specialists, and professional theatricians.
3. To prepare students for successful study at the graduate level in various speech communication, mass communication and theatre arts disciplines and in speech-oriented careers such as law, business, government, speech pathology/audiology and the ministry.
4. To develop in the student the power of independent and creative thinking critical judgment, and individual initiative.
5. To provide students with a variety of practical professional internships and experiences in order for them to gain much needed skills, using the tools of modern technology.
6. To provide a variety of speech, communication and theatre courses in order that students may meet the general education requirements of the University.

DEGREES OFFERED

Speech—B.A.

Speech and Theatre—B.A.

Professional Theatre—B.F.A.

Public Relations—B.A.

Broadcast News—B.A.

Broadcast Production—B.A.

Print Journalism—B.A.

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree programs in the Department of Speech Communication and Theatre Arts is based upon the general admission requirements of the University. All majors are expected to maintain a minimum grade point average of 2.0.

All communications majors must meet certain prerequisites prior to beginning sophomore level communications courses required in their chosen major. They must

- a. make a grade of "C" or better in the grammar laboratory course.
- b. make a grade of "C" or better in the freshman composition courses.
- c. pass an oral proficiency test.
- d. exhibit a minimum typing proficiency of 35 words per minute.

To remain in the communications program, a student must

- a. maintain a minimum overall 2.5 grade point average in major courses.
- b. declare a minor by the sophomore year.
- c. maintain a minimum 2.0 grade point average in the minor course of study.
- d. complete an internship with an approved media organization.

*On Leave.

In order to become a candidate for the Bachelor of Fine Arts degree with a concentration in acting, a student must:

- a*. Successfully complete Acting I & II with a grade "B" or above.
- b. Successfully pass an acting audition for B.F.A. students. The ten (10) minute audition must be of two (2) or more of the following contrasting materials: Comedy, drama, tragedy, song and dance. The passing average is 80%.
 1. No student may become eligible for the B.F.A. acting program after the junior year unless special permission is granted.
 2. Permission to perform must be requested in writing to the Director of Theatre at least one week prior to the occasion. The student making the request must present the selection in the presence of the acting staff and receive an overall rating of satisfactory. A denial to perform is final. There Is No Recourse.
 3. All B.F.A. acting students must present a 20 minute one person show or direct a full length show during their final semester in residency.
 4. All acting students are required to perform an audition in at least two of the following:
 - a. M.F.A. Program
 - b. North Carolina Theatre Conference (NCTC)
 - c. Southeastern Theatre Conference (SETC)
 - d. Irene Ryan Audition
 - e. University Regional Theatre Audition (URTA)

* Students making a grade of "C" in one Acting Course and a "B" in the other may petition for special entry into the program. Should the student make a "C" in two (2) acting courses he or she will automatically be dropped from the acting program.

DEPARTMENTAL REQUIREMENTS

The Speech Communication Education major must complete a minimum of 124 semester hours of University courses. Included in the 124 semester hours are forty-six hours of general education courses; forty-seven semester hours of course work in the specialty area; twenty-five semester hours of professional education courses and seven elective hours. A minimum grade of "C" must be achieved in these courses.

The theater education major must complete a minimum of 124 semester hours of University courses. Included in the 126 semester hours are forty-six semester hours of general education courses; fifty-two semester hours of course work in the specialty area; twenty-five hours of professional education courses and three elective hours. A minimum grade of "C" must be achieved in these courses.

Speech Pathology and Audiology Option—Students pursuing a preprofessional degree in speech pathology and audiology must complete a minimum of 124 semester hours of University courses. Included in the 124 semester hours are forty-six semester hours of speech communication courses at the 200 level or above. A minimum grade of "C" must be earned in these courses.

Communications Major—The communications major must complete a minimum of 124 semester hours of University courses. Included in these 124 semester hours are thirty-three semester hours of communication courses and a minimum of eighteen semester hours in a declared minor. A minimum grade of "C" must be earned in these courses.

Professional Theatre—A major in professional theatre must complete a minimum of 124 semester hours of University courses. The BFA candidate must complete sixty semester hours of theatre courses at the 200 level or above. The BA candidate must complete a minimum of fifty eight semester hours of theatre courses at the 200 level or above.

ACCREDITATION

The Bachelor of Fine Arts in Acting is accredited by the National Association of Schools of Theatre (NAST).

All Teacher Education Programs are accredited by the National Council for Accreditation of Teacher Education and approved by the North Carolina State Department of Public Instruction.

CAREER OPPORTUNITIES

Prospects of employment with a teaching degree in speech or theater will vary. An advanced degree in teaching will provide more flexibility in the selection of available positions in public, private and parochial schools and in colleges and universities.

A liberal arts degree in Speech Communication and Theatre Arts will prepare students for careers in personnel, public relations, and human relations. Corporations, consulting firms, manufacturing firms, educational institutions and state and local government agencies will provide many job opportunities in personnel and public relations. Competition at the entry level will be keen.

With a master's degree in speech pathology or audiology, employment in clinics, schools, hospitals, state and federal government agencies, is favorable but competitive. Competition for teaching positions in colleges and universities will be very keen.

Careers in theatre aside from acting are just beginning to unfold. Job opportunities in technical theatre and theatre management are expected to increase with the advent of regional repertory theatres. A degree in professional theatre may also prepare students for careers in drama therapy, interior decorating and design and home planning.

Forecasts for the future of the communication industry are bright. With the development of electronic technology for information dissemination, all aspects of communication will thrive. Entry level positions are numerous but competition is very keen.

CURRICULUM GUIDE FOR THE MAJOR IN SPEECH AND THEATRE

(Option: Theatre Education)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
THEA 260	3	EASC 201 ¹	3
BIOL 100	4	HIST 101/205	3
HIST 100/204	3	THEA 215	2
THEA 214	<u>2</u>	PHED 101	<u>1</u>
	18		15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ²	3	FOLA ²	3
SPCH 250	3	ENGL 201	3
THEA 211	3	THEA 212	3
THEA 231	3	THEA 216	2
ENGL 200	3	PSYC 320	3
CUIN 300	<u>2</u>	PHED 200	<u>2</u>
	17		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 321	3	THEA 362	3
THEA 361	3	SPCH 321	3
CUIN 301	2	CUIN 400	3
THEA 311	3	THEA 312	3
THEA 241	3	THEA 421	3
THEA 461	<u>3</u>	THEA 462	<u>3</u>
	17		18

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 259	3	CUIN 500	3
CUIN 436	3	CUIN 624	3
CUIN 539	3	CUIN 560	<u>6</u>
SPCH 451	3		12
THEA 443	<u>3</u>		
	15		

Total Hours: 128

¹ CHEM 100 may be substituted.

² Elementary French, Spanish or German

CURRICULUM GUIDE FOR THE MAJOR IN BROADCAST PRODUCTION

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
PHYS 200	2	BIOL 100	4
PHED 109	1	PHED 110	1
COMM 150	1	SPCH 116	1
Elective	2	Free Elective	<u>3</u>
COMM 131	<u>1</u>		18
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ¹	3	FOLA ¹	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	COMM 345	3
COMM 220	3	COMM 231	1
COMM 202	<u>3</u>	Electives ²	<u>6</u>
	15		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Electives ²	6	SPCH 351	3
COMM 308	3	Elective ²	3
PSYC 320	3	COMM 408	3
COMM 307	3	COMM 331	1
Elective	<u>2</u>	COMM 407	3
	17	Elective (Humanities)	<u>3</u>
			16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMM 422	3	COMM 498	3
SPCH 451	3	Elective (SOCl)	3
Elective ²	3	Free Electives	<u>5</u>
COMM 317 or 418	3		11
COMM 392	<u>3</u>		
	15		

Total Hours: 124

¹ French, Spanish or German through Intermediate level.

² Required courses for the minor.

CURRICULUM GUIDE FOR THE MAJOR IN BROADCAST NEWS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	PHED 110	1
PHED 109	1	SPCH 116	1
COMM 131	1	COMM 150	1
Free Electives	3	CHEM 100/110	4
	<u>18</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ¹	3	FOLA ¹	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	COMM 220	3
PSYC 320	3	SPCH 351	3
COMM 231	1	Elective ²	3
COMM 202	3		<u>3</u>
	<u>16</u>		<u>15</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMM 325	3	SPCH 309	3
COMM 308	3	COMM 345	3
COMM 307	3	COMM 331	1
Electives ²	3	Electives ²	3
POLI 200	3	COMM 335	3
	<u>15</u>		<u>13</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMM 422	3	Elective (Humanities)	3
SPCH 451	3	Electives	6
COMM 392	3	COMM 498	3
COMM 431	1	Electives ²	3
Elective ²	3		<u>15</u>
SPCH 321	3		
	<u>16</u>		

Total Hours: 124

¹ Required courses for the minor.

² French, Spanish or German through Intermediate level.

CURRICULUM GUIDE FOR THE MAJOR IN PRINT JOURNALISM

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100/110	4
PHED 109	1	PHED 110	1
ENGL 102	<u>2</u>	COMM 150	1
	16	Free Elective	<u>3</u>
			18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ¹	3	FOLA ¹	3
ENGL 200	3	ENGL 201	3
COMM 220	3	SPCH 250	3
ENGL 210	3	COMM 230	3
COMM 202	<u>3</u>	Elective	3
	15	COMM 131	<u>1</u>
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PSYC 320	3	Elective (Humanities)	3
COMM 320	3	COMM 340	3
COMM 231	1	Electives ²	6
COMM 392	3	COMM 330	<u>3</u>
Electives ²	<u>6</u>		15
	16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SOCI 100	3	COMM 498	3
POLI 200	3	Electives	<u>8</u>
COMM 376	3		11
COMM 402	2		
Electives ²	<u>6</u>		
	17		

Total Hours: 124

¹ Required courses for the minor.

² French, Spanish or German through Intermediate level.

CURRICULUM GUIDE FOR THE MAJOR IN PUBLIC RELATIONS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	CHEM 100/110	4
PHED 109	1	PHED 110	1
ENGL 102	<u>2</u>	COMM 150	1
	16	Free Elective	<u>3</u>
			18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ¹	3	FOLA ¹	3
ENGL 200	3	ENGL 201	3
COMM 220	3	SPCH 250	3
ENGL 202	3	COMM 230	3
Elective ²	<u>3</u>	Electives ²	<u>6</u>
	15		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PSYC 320	3	Elective (Humanities)	3
COMM 320	3	COMM 340	3
COMM 376	3	Electives ²	6
COMM 392	3	COMM 386	3
COMM 131	1	COMM 231	<u>1</u>
Electives ²	<u>3</u>		16
	16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMM 402	2	SOCI 100	3
COMM 496	3	COMM 498	3
POLI 200	3	Electives	<u>5</u>
ENGL 331	3		11
Electives ²	<u>3</u>		
	14		

Total Hours: 124

¹ Required courses for the minor.

² French, Spanish or German through Intermediate level.

CURRICULUM GUIDE FOR THE MAJOR IN SPEECH AND THEATRE
(Option: Speech Education)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100/204	3	HIST 101/205	3
BIOL 100	4	PLSC 201/CHEM 100	3-4
THEA 203	<u>2</u>	PHED 200	2
	15	SPCH 116	1
		Free Elective	<u>2</u>
			17-18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ¹	3	FOLA ¹	3
ENGL 200	3	ENGL 201	3
SPCH 250	3	SPCH 351	3
THEA 303	3	THEA 304	2
PSYC 320	3	SPCH 321	3
THEA 302	<u>3</u>	SPCH/THEA LAB	1
	18	CUIN 300	<u>2</u>
			17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 259	3	SPCH 361	3
THEA 440	3	SPCH 451	3
ENGL 300	3	SPCH 461	3
COMM 150	1	CUIN 400	3
SPCH 309	3	Major Elective (SPCH 680/	
CUIN 301	2	THEA 405/COMM 307/407)	<u>3</u>
SPCH 253	<u>2</u>		15
	17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 436	3	CUIN 500	3
CUIN 539	3	CUIN 624	3
THEA 620/651	3	CUIN 560	<u>6</u>
Electives	3-4		12
SPCH 319	<u>3</u>		
	15-16		

Total Hours: 124-128

¹ Intermediate French, Spanish or German.

CURRICULUM GUIDE FOR THE MAJOR IN PROFESSIONAL THEATRE

(Options: Liberal Arts)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
EASC 201	3	PHYS 101	3
MATH 101	3	MATH 102	3
SPCH 116	1	HIST 101	3
THEA 260	3	THEA 216	2
HIST 100	3	ART 224	2
	<u>16</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ²	3	FOLA ²	3
SPCH 250	3	THEA 215	2
PSYC Elective	3	PSYC 320	3
THEA 211	3	THEA 363	3
THEA 214	2	HUM Elective	3
THEA LAB 100	1	THEA LAB 200	1
	<u>15</u>	PHED 200	2
			<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 361	3	THEA 362	3
THEA 364	3	THEA 365	3
Free Elective	3	Free Elective	3
THEA 461	3	THEA LAB 400	1
THEA LAB 300	1	THEA (Electives)	3
THEA (Electives)	3	THEA 462	3
	<u>16</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 321	3	THEA 331	3
THEA 366	3	THEA 463	3
THEA 444	3	Free Electives	4
Free Electives	3	THEA 421	3
THEA (Electives)	3		13
	<u>15</u>		

Total Hours: 124

¹ CHEM 100 may be substituted.

² Elementary French, German or Spanish.

CURRICULUM GUIDE FOR THE MAJOR IN PROFESSIONAL THEATRE

(Option: Theatre Technology)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
EASC 201 ¹	3	PHYS 101	3
MATH 101	3	MATH 102	3
SPCH 116	1	HIST 101	3
THEA 231	3	THEA 260	3
HIST 100	<u>3</u>	ART 223	<u>2</u>
	16		17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ²	3	FOLA ²	3
SPCH 250	3	THEA 342	3
PSYC Elective	3	PSYC 320	3
THEA 211	3	THEA 331	3
THEA 241	3	ENGL (Humanities Elective)	3
THEA LAB 100	<u>1</u>	THEA LAB 200	<u>1</u>
	16		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 361	3	THEA 362	3
THEA 443	3	THEA 444	3
THEA (Elective)	3	PSYC Elective	3
THEA 452	3	THEA LAB 400	1
THEA LAB 300	1	THEA 216	2
THEA 364	<u>3</u>	THEA 365	<u>3</u>
	16	PHED 200	<u>2</u>
			17

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 321	3	THEA 421	3
Free Elective	3	THEA 463	3
THEA 451	3	THEA 472	3
THEA 471	3	THEA 453	3
THEA (Elective)	<u>3</u>	Free Elective	<u>3</u>
	15		15

Total Hours: 128

¹ CHEM 100 may be substituted.

² Elementary French, German or Spanish.

Note: Take Elementary through Intermediate Level (12 hours) with no high school background in that particular language.

Take Intermediate Level (6 hours) with a high school background in that particular language.

CURRICULUM GUIDE FOR THE MAJOR IN PROFESSIONAL THEATRE (Option: Acting)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
EASC 201 ¹	3	PHYS 101	3
MATH 101	3	MATH 102	3
SPCH 116	1	HIST 101	3
THEA 211	3	THEA 212	3
HIST 100	3	THEA 214	2
	<u>16</u>	SPCH 117	<u>1</u>
			18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA ²	3	FOLA ²	3
SPCH 250	3	THEA 260	3
SOC SC Elective	2	PSYC 320	3
THEA 231	3	THEA 312	3
THEA 311	3	THEA 342	3
THEA LAB 100	1	THEA LAB 200	1
PSYC Elective	3	PHED	<u>2</u>
	<u>18</u>		18

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
THEA 411	3	THEA 412	3
THEA 451	3	THEA 362	3
THEA 216	2	THEA 462	3
THEA 361	3	SPCH 321	3
THEA 215	2	MUSI ELECTIVE	1
THEA LAB 300	1	THEA LAB 400	1
THEA 321	3	THEA 421	<u>3</u>
	<u>17</u>		17

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Free Elective	3	THEA 472	3
THEA 364	3	THEA 463	3
Elective (Humanities)	3	THEA 444	3
THEA 443	<u>3</u>	THEA 365	<u>3</u>
	12		12

Total Hours:128

¹ CHEM 100 may be substituted.

² Elementary French, Spanish, or German.

CURRICULUM GUIDE FOR THE MAJOR SPEECH (Option: Speech Pathology)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 100	3	HIST 101	3
BIOL 100	4	BIOL 461	4
PHED 101 or PHED 200	1-2	PHED 101 or PHED 100	1-2
Free Electives	<u>3</u>	ART 224	<u>2</u>
	17-18		16-17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA (GERM, FREN, FOLA) ¹	3	FOLA (GERM, FREN, FOLA) ¹	3
ENGL 200 or 202	3	ENGL 201 or 202	3
PSYC 320	3	Electives	3
SPCH 250	3	ENGL 300	3
SOCI 100	3	SPCH 116	1
SPCH 259	<u>3</u>	MUSI 216	<u>3</u>
	18		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Major Elective (THEA 620)	3	SPCH 329	3
SPCH 309	3	SPCH 359	3
SPCH 269	3	Major Electives (SPECH	3
SPCH 279	3	461, 451)	
Free Electives	<u>3</u>	Free Elective	<u>3</u>
	15		12

Senior Year			
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
SPCH 319	3	SPCH 369	3
SPCH 409	3	SPCH 429	3
HOEC 421	3	Free Electives	5
SPCH 419	3	SOCI 302	3
SPCH 351	3		14
	<hr/> 15		

Total Hours: 124-125

¹ Take Elementary through Intermediate Level (12 hours) with no high school background in that particular language. Take Intermediate Level (6 hours) with a high school background in that particular language.

COURSES WITH DESCRIPTION FOR SPEECH

SPCH-116. Voice and Diction Lab I (Formerly Speech 216) **Credit 1(0-2)**

A course in speech improvement. Emphasis on articulation, pronunciation and projection.

SPCH-117. Voice and Diction Lab II **Credit 1(0-2)**

Continuation of Speech 116. Work under critical scrutiny to improve articulation, pronunciation and voice quality.

SPCH-118. Development of General American Speech Patterns **Credit 1(0-2)**

Topics include the development of General American speech patterns, the role and value of dialects, and the social functions of language.

SPCH-119. Speech Improvement for Foreign Students **Credit 1(0-2)**

Instruction and practice in the development of speech intelligibility. For foreign students who wish to increase the intelligibility of their spoken American English.

SPCH-250. Speech Fundamentals **Credit 3(3-0)**

Introduction to the rhetorical, psychological, physiological, linguistic, and communication bases of oral disclosure. Preparation and practice in intrapersonal, interpersonal and public communication, and critical listening. SPCH 116 is a recommended prerequisite for students with nonstandard speech and voice patterns.

SPCH-253. Parliamentary Procedures **Credit 2(2-0)**

Theory and practice in the rules and customs governing the organization and proceedings of deliberative bodies. Prerequisite: SPCH 250.

SPCH-259. Introduction to Speech Pathology **Credit 3(3-0)**

A study of the causes, symptoms, and treatment of minor speech disorders, basic theories underlying speech correction. Aimed at preparing the classroom teacher to identify common speech disorders and to make referrals to speech therapists.

SPCH-269. Introduction to Audiology **Credit 3(3-0)**

A study of hearing, both normal and abnormal, with information on the nature, causes, identification and rehabilitation treatment of persons with hearing disorders. Prerequisite: Advanced standing.

SPCH-279. Anatomy and Physiology of the Ear and Vocal Mechanism **Credit 3(3-0)**

A study of the organs and systems of the body related to the processes of hearing and speech. Prerequisite: Juniors and seniors or consent of the instructor.

SPCH-309. Phonetics**Credit 3(3-0)**

Broad transcription: The International Phonetic Alphabet; Standards of pronunciation; dialectal variations in America; physiological and acoustical bases of speech sounds. Prerequisite: SPCH 250 or consent of the instructor.

SPCH-319. Development of Speech and Language in Children**Credit 3(3-0)**

The growth of speech and language in children; theories of speech and language development. Prerequisite: Successful completion of SPCH 259.

SPCH-321. Oral Reading and Interpretation**Credit 3(3-0)**

A study of the analysis and the oral interpretation, of the forms of classical and modern literature, e.g. poetry, narrative prose, the essay, and dramatic literature. Oral practice in individual and group projects. Prerequisite: SPCH 250.

SPCH-329. Voice and Articulation Disorders**Credit 3(3-0)**

Consideration of theories, principles, and procedures for appraisal and treatment of voice and articulatory deviations. Prerequisite: SPCH 259.

SPCH-351. Public Speaking**Credit 3(3-0)**

A study of the methods by which public speeches are made clear, interesting and forceful; practice in writing and delivering speeches according to the audience and occasion. Prerequisite: SPCH 250.

SPCH-359. Principles of Audiometry**Credit 3(3-0)**

A study of the techniques of hearing assessment in clinical, educational, industrial, and medical settings; interpretation of test results. Prerequisites: Successful completion of SPCH 269 and 279.

SPCH-361. Argumentation and Debate**Credit 3(3-0)**

Study and practice in analysis, gathering of material, briefing, ordering of arguments and evidence, refutation, and delivery. Prerequisite: SPCH 250.

SPCH-369. Aural Rehabilitation**Credit 3(3-0)**

A study of the major theories of speech reading and procedures for teaching visual communication skills to hearing impaired persons. Prerequisites: SPCH 269, 359, and 309.

SPCH-409. Organic Disorders**Credit 3(3-0)**

A study of theories, principles and procedures for appraisals and treatment of deviant voice and articulation that accompany cerebral palsy, cleft palate, maxillofacial injuries, and other physical anomalies. Prerequisites: SPCH 259, 329.

SPCH-419. Introduction to Stuttering**Credit 3(3-0)**

A study of theories, principles and procedures for the appraisal and treatment of persons with dysfluencies of speech. Prerequisite: SPCH 259.

SPCH-429. Clinical Practicum I**Credit 3(3-0)**

Supervised clinical experiences in the management of speech language and/or hearing disorders; includes interviews, diagnosing and formulating and carrying out a plan of therapy. Prerequisites: Successful completion of 12 hours of Speech Pathology and Audiology courses and consent of Clinical Supervisor.

SPCH-451. Persuasive Communication**Credit 3(3-0)**

A study of the theory and practice of persuasive speaking in the democratic society, including formal and informal persuasive speaking, types of proof, and the ethics of persuasion. Practice in the preparation and presentation of persuasive messages. Prerequisite: SPCH 250.

SPCH-461. Group Discussion**Credit 3(3-0)**

A study of the forms of discussion and the principles and methods underlying them. Practice in leading and participating in discussion situations. Prerequisite: SPCH 250.

SPCH-539. Methods of Teaching Speech and Theatre **Credit 3(3-0)**
A study of the aims, objectives, problems and difficulties experienced in teaching speech in the modern school. Special attention is given to the organization and coordinator of both speech and theatre curriculums, to planning courses of study, its presentation, and to the selection of materials and equipment required of all Speech and Theatre Education majors. Prerequisites: 27 hours of Speech and 15 hours of Education and Psychology.

SPCH-561. Rhetoric of American Thought **Credit 3(3-0)**
A critical study of selected American orators—their speech making on controversial social and political issues from 1830-1960, as well as the impact upon their audiences. Black American orators included. Prerequisite: SPCH 250.

SPCH-610. Speech for Teachers **Credit 2(2-0)**
Study and application of the fundamental principles of oral communication related to teaching and learning; speech activities and interpersonal relations identified with teaching and learning and the teaching profession; exercises for self-improvement in the various speech processes.

COMMUNICATIONS

COMM-131. Practicum I **Credit 1(0-2)**
Student serves on staff of campus newspaper, TV studio, radio station, theatre or in a public relations capacity in a University Office.

COMM-150. Grammar Lab for Communicators **Credit 1(0-2)**
Instruction in journalistic style writing with emphasis on principles of spelling, sentence structure, grammar, diction and usage. Must pass departmental competency examination.

COMM-202. Introduction to Mass Media **Credit 3(3-0)**
Survey of mass media, including newspapers, magazines, radio and television. Prerequisite: COMM 150.

COMM-220. News Writing (Formerly English 225) **Credit 3(2-2)**
Study of elements of news stories, writing of leads, organization and writing of various types of news stories for newspapers, radio and television. Prerequisites: COMM 150 and ability to type and use computer terminals.

COMM-230. Public Affairs Reporting (Formerly English 231) **Credit 3(3-0)**
Consists of advanced training in specialized reporting. Extensive practice in reporting news and government and legislative agencies. Prerequisite: COMM 220.

COMM-231. Practicum II **Credit 1(0-2)**
Student serves on staff of campus newspaper; TV studio, radio station, theatre or in public relations capacity in a University Office.

COMM-302. Minorities in Mass Media (Formerly Speech 260) **Credit 3(3-0)**
An overview of past and present minority contributions in the areas of major motion pictures, radio, television newspaper and magazine. This course will also present a close look at minority roles in contemporary media development, with emphasis on possible career opportunities for minorities.

COMM-307. Television Production I (Formerly Speech 256) **Credit 3(2-2)**
Methods and techniques in television production, directing and announcing; program design, lighting, audio, camera, and electronic techniques. Lab. practice. Prerequisites: SPCH 116 and COMM 345.

- COMM-308. Radio Production I (Formerly Speech 255)** **Credit 3(2-2)**
 Practical experience in radio broadcasting techniques and conventional studio practices; projects in radio announcing. Programs are planned and executed by the students. Prerequisites: SPCH 116 and COMM 345.
- COMM-312. Survey of Visual Styles** **Credit 2(2-0)**
 An introduction to the study of basic visual techniques and styles utilized in theatrical films and television productions.
- COMM-317. Video Editing** **Credit 3(3-0)**
 Instruction and practice in methods of video editing. Prerequisite: COMM 407.
- COMM-320. News Editing and Layout (Formerly English 230)** **Credit 3(3-0)**
 A continuation of COMM 230, with primary emphasis on basic copyediting. Extensive practical work copyediting, headline writing, principles of typography and makeup. Weekly outside news and feature assignments constitute the laboratory period. Prerequisite: COMM 230.
- COMM-325. Broadcast News Writing** **Credit 3(3-0)**
 Analysis of broadcast journalism, reporting, writing and editing of news for radio and television in oral and visual modes. Prerequisite: COMM 220.
- COMM-330. Reporting Techniques for Print Media** **Credit 3(3-0)**
 Exercises in news gathering, interviewing, and writing news for print media. Prerequisite: COMM 230.
- COMM-331. Practicum III** **Credit 1(0-2)**
 Student serves on staff of campus newspaper, TV studio, radio station, theatre or in a public relations capacity in a University Office.
- COMM-335. Reporting Tech. for Broadcast Media** **Credit 3(3-0)**
 Exercises in news gathering, interviewing and writing news for broadcast media. Prerequisite: COMM 325.
- COMM-340. Feature Writing (Formerly English 330)** **Credit 3(3-0)**
 An intensive practicum of feature writing involving background research for an indepth report of various topics. Prerequisites: COMM 220, 230.
- COMM-345. Writing for Radio and Television** **Credit 3(3-0)**
 A survey course to introduce the fundamentals of writing nonfiction and nondramatic broadcast material, which includes public service announcements, informational copy, talk shows, music continuity; plus standard and specialized formats. Students are required to demonstrate an understanding of these fundamentals by completing a variety of practical writing assignments. Prerequisite: COMM 220.
- COMM-376. Public Information & Public Relations Techniques**
(Formerly English 464) **Credit 3(3-0)**
 Publicity and promotion methods are employed by educational institutions, federal agencies and private industries; how to communicate through newspapers, magazines, radio-television stations and other media. Prerequisites: COMM 230 and 345.
- COMM-386. Advanced Public Relations** **Credit 3(3-0)**
 Instruction in planning, developing, and evaluating aspects of internal and external communications programs. Budgeting, audience and media selection, special events and public relations campaigns. Prerequisite: COMM 376.
- COMM-392. Communications Law and Ethics** **Credit 3(3-0)**
 Survey of legal and extra-legal limitations on press freedom. Study of legal issues including libel, free press-fair trial, contempt of court, copyright, access law. Prerequisite: Junior standing.

COMM-402. Current Issues in Mass Communications**(Formerly English 462)****Credit 2(2-0)**

A study of the rights, responsibilities and changing characteristics of the mass media and the problems therein. Extensive use of mass communications practitioners and guest speakers, and field trips. Prerequisite: COMM 392.

COMM-407. Television Production II (Formerly Speech 351)**Credit 3(2-2)**

Additional practice in the theories and methods of producing writing, and directing various types of television productions. Laboratory practice. Prerequisite: COMM 307.

COMM-408. Radio Production II (Formerly Speech 350)**Credit 3(2-2)**

Broadcast announcing styles. It will include preparation for acquiring the FCC Restrictive Operators Permit. Prerequisite: COMM 308.

COMM-417. Advanced Video Production**Credit 3(3-0)**

Refined video production techniques are developed through the creation of individual video programs. Prerequisite: COMM 317.

COMM-418. Audio Production**Credit 3(3-0)**

Practical application of announcing, production and editing techniques are developed through the creative production of audio tapes for narrations, public service and commercial announcements and programs. Prerequisite: COMM 408.

COMM-422. Broadcast Management and Programming**Credit 3(3-0)**

An examination of the planning and policy functions of management.

COMM-431. Practicum IV**Credit 1(0-2)**

Student serves on staff of campus newspaper, TV studio, radio station, theatre or in public relations capacity in a University Office.

COMM-437. Field Production**Credit 3(3-0)**

Practical application of out-of-studio production techniques and theories for audio and video programs. Prerequisite: COMM 317.

COMM-431. Practicum IV**Credit (10-2)**

Student serves on staff of campus newspaper, TV studio, radio station, theatre or in public relations capacity in a University Office.

COMM-440. Editorial Writing (Formerly English 333)**Credit 3(3-0)**

A study of interpretation and comment and practical experiences in the writing of various types of editorials. Students make a practical analysis of various editorials.

COMM-486. Print and Radio/TV Advertising (Formerly English 334)**Credit 3(3-0)**

This course will concentrate primarily on the writing of advertising copy for newspapers, magazines, direct mail and radio, and writing of storyboard commercials for television. A detailed study of how to gather, synthesize and assemble data for an advertisement will be covered. Promotional concepts of advertising will be given some treatment. Advertising art work will not be emphasized in detail. Prerequisite: COMM 386.

COMM-492. Cable Television Seminar (Formerly Speech 491)**Credit 3(3-0)**

Review of the development of cable-television in the U.S., including the law governing it, technical facilities necessary for an operation, methods of financing type of programming content. The course will also focus on the advantages and disadvantages of minorities in programming. Prerequisites: COMM 392, 422.

COMM-496. Publications Design and Layout**Credit 3(3-0)**

Learning the principles of publications design and layout with actual practice on the campus laboratory publication. With lab. Prerequisite: COMM 376.

COMM-498. Media Internship**Credit 3(1-4)**

Field learning experience designed to assist students in applying Mass Communication research and theory in the development of professional practices, skills, and attitudes. Academic supervision provided by faculty member, and direction in the field provided by approved supervisor. Prerequisite: Communication Workshop.

THEATRE**THEA-201. Drama Appreciation****Credit 3(3-0)**

An introductory survey of the contributions of the playwright, actor, director and designer to drama and the theatre.

THEA-203. Theatre Movement I**Credit 2(2-0)**

An introduction to the variety of activities used by the actor for movement, rhythmic and fencing to train the body for effective stage mechanics and versatility.

THEA-204. Theatre Movement II**Credit 2(2-0)**

This course is designed to develop an awareness of expressive artistic movement. Specific topics will include: Alexander techniques, theatre movement, mime, and pantomime, jazz dance, and physical conditioning. Prerequisite: THEA 203.

THEA-302. Elements of Play Production**Credit 3(2-2)**

Study of basic principles in all aspects of production and application of these principles to particular situations; affords opportunities for practical experience in acting, directing, lighting, scenery design, and construction. Prerequisite: THEA 201.

THEA-303. Acting I (Formerly Theatre 301)**Credit 3(2-0)**

Examination of the actor's craft through improvisation, text analysis, and basic acting techniques.

THEA-304. Acting Laboratory I**Credit 2(2-0)**

Continuation of Acting I with concentration on scene study drawn from the modern repertoire. Prerequisite: THEA 303.

THEA-403. Acting II (Formerly Theatre 654)**Credit 3(3-0)**

Development of creativity and imagination, along with techniques, of acting, using monologues from modern plays. Special emphasis will be given to auditioning professionally. Prerequisite: THEA 303.

THEA-404. Acting Laboratory II**Credit 2(2-0)**

Exploration of the special demands of auditioning with emphasis on scene study from contemporary drama. Prerequisite: THEA 403.

THEA-405. Improvisational Theatre**Credit 2(1-2)**

The student is encouraged to examine the means by which he becomes an actor, through improvisation, scene study and finally improvising a play.

THEA-440. Play Directing**Credit 3(3-0)**

Elementary principles of staging plays; practical work in the directing of the one-act play; attention is given to the principles of selecting, casting, and rehearsing of plays. Exercises, lectures, and demonstrations. Prerequisites: THEA 302, 303.

THEA-441. Stagecraft**Credit 3(3-0)**

Study of basic principles of scenery construction and painting; practice in mounting productions for major show. Prerequisite: THEA 302.

THEA-442. Stage Lighting (Formerly Theatre 655) **Credit 3(2-2)**

A beginning course in stage lighting that emphasizes the practical aspects of lighting a production. Students learn through exposure to and working with, the variety of equipment available to meet the lighting demands of any play. In addition, there are discussions of electricity, design, color and special effects. Prerequisite: THEA 302.

THEA-443. Scene Design **Credit 3(1-4)**

A course in perspective, dealing with the representation of common objects, interiors, buildings, and landscapes as they appear to the eye. One hour lecture and two hours laboratory each week. Prerequisite: THEA 441.

THEA-444. Stage Management **Credit 3(3-0)**

Techniques and conventions commonly used for staging, producing, planning, rehearsing, and coordinating, according to the requirements and professional standards per Actors' Equity Association Rule Book. Class and lecture.

THEA-457. Essentials of Playwriting **Credit 3(3-0)**

Emphasis on creative work and class criticism; structure, characterization and dialogue are studied with reference to standard plays. Prerequisite: Consent of the instructor. May be repeated for credit.

THEA-500. History of the Theatre I **Credit 3(3-0)**

A survey of theatre practices, playwrights, and productions from the Greeks to the Seventeenth Century. Prerequisite: THEA 302 or consent of the instructor.

THEA-501. History of the Theatre II **Credit 3(3-0)**

A continuation of Theatre I beginning with the Seventeenth Century and continuing to the present. Prerequisite: THEA 302 or consent of the instructor.

THEA-503. Acting III (Formerly Theatre 666) **Credit 3(3-0)**

This course is designed to emphasize the styles of acting in Greek, and Shakespearean plays.

THEA-504. Acting Laboratory III **Credit 2(2-0)**

Continuation of Acting III with emphasis upon special acting of restoration, comedy of manners and farce. Prerequisite: THEA 503.

THEA-599. Theatre Internship **Credit 6(0-12)**

This course is designed to provide the student with a collaborative field experience in the profession. These experiences may or may not be salaried positions in a professional theatre or arts administration company. The student must be a participating performer, manager or designer/technician. Prerequisite: Junior/Senior standing.

THEA-620. Creative Dramatics **Credit 3(3-0)**

Theory and function of creative dramatics and applications in elementary education; demonstrations with children; special problems for graduate students. Prerequisite: Senior level standing or consent of instructor.

THEA-630. Black American Drama **Credit 3(3-0)**

A study of the history and criticism of African American Drama and Theatre from 1821 to the Present.

THEA-631. Modern American Drama and Theatre since 1900 **Credit 3(3-0)**

A study of significant developments in the American Theatre since 1900 as reflected through the major playwrights and theatre organizations.

THEA-650. Theatre Management **Credit 3(3-0)**

Designed to study the tools of theatre management and producing: box office, price and percentages, publicity, promotion and production costs. Dealing with publishers and agencies. Community theatre problems are analyzed. Prerequisite: None.

THEA-651. Children's Theatre (Formerly Theatre 650)**Credit 3(3-0)**

Various techniques used in producing children's theatre with adult actors; experience in scene design, lighting, costuming, acting, directing and promotion; class work plus participation in the Children's Theatre Workshop are required. Prerequisite: THEA 620.

THEA-652. Stage Make-Up**Credit 2(1-2)**

Principles of stage make-up; use of materials, wigs, beards and masks. Practical application of all types will be employed to insure understanding. Prerequisite: None.

THEA-653. Principles and Practice of Stage Costume**Credit 3(2-2)**

The function of costumes for the stage and for television, and their relationship to other elements of dramatic production. Includes research in construction and authentic period forms. Prerequisite: Consent of the instructor.

THEA-655. Advanced Play Production**(3 hrs.)**

A study of modern methods of staging and lighting plays. Directing on a multiple set; arena staging, intellectual values, script analysis.

THEA-656. Advanced Directing**Credit 3(2-2)**

A consideration of rehearsal problems and techniques as may be reflected in the 2-act play. In conjunction with the acting classes and the Richard B. Harrison Players, students direct projects selected from a variety of genres. Prerequisites: THEA 440, 443.

THEA-67. Seminar in Theatre**Credit 3(3-0)**

Advanced individual study for the theatre major in a specialized, concentrated production project. Consent of the instructor and Director of Theatre is necessary. Professional theatre majors only.

LABORATORY COURSES**THEA-100. Speech and Theatre Laboratory****Credit 1(0-2)**

A laboratory providing practical experiences within the appropriate discipline. Prerequisite: None.

THEA-200. Speech and Theatre Laboratory**Credit 1(0-2)**

A laboratory providing practical experience within the appropriate disciplines. Prerequisites: SPCH and THEA 100.

THEA-300. Speech and Theatre Laboratory**Credit 1(0-2)**

A laboratory providing practical experiences within the appropriate disciplines. Prerequisites: SPCH and THEA 200.

THEA-400. Speech and Theatre Laboratory**Credit 1(0-2)**

A laboratory providing practical experiences within the appropriate disciplines. Prerequisites: SPCH and THEA 300.

ADVANCED UNDERGRADUATE COURSE**THEA-680. Independent Study in Speech Communication and Theatre Arts****Credit 3(3-0)**

An independent study of special topics in the area of speech communication and theatre arts determined by the student in consultation with the instructor. Prerequisite: Permission of Dept. Chairperson and supervising instructor. Junior or senior standing.

DIRECTORY OF FACULTY

- Frankie Day, B.A., South Carolina State College; M.F.A., Southern Illinois University
- Samuel A. Hay, B.A., Bethune-Cookman College; M.A., The Johns Hopkins University; Ph.D., Cornell University; Professor and Interim Chairperson
- Jacqueline P. Jones, B.A., North Carolina A&T State University; M.A., Ball State University; Lecturer
- Miller Lucky, Jr., B.F.A., N.C. A&T State University; M.F.A., University of Florida (Gainesville)
- Richard Moore, B.S., North Carolina A&T State University; M.S. Columbia University; Ed.D., University of North Carolina Greensboro; Associate Professor
- Nagatha Tonkins, B.A., North Carolina A&T State University; M.Ed., North Carolina A&T State University; Lecturer
- Teresa Styles, B.A., Spelman College; M.A., Northwestern University; Assistant Professor
- Mary M. Tuggle, B.S., Hampton Institute; M.Ed., Marygrove College, Ph.D., Michigan State University; Associate Professor and Chairperson
- Anthony Welborne, B.S., M.S. North Carolina A&T State University, General Manager of Radio station

SCHOOL OF BUSINESS AND ECONOMICS

Quiester Craig, Dean
Danny Pogue, Assistant Dean

MISSION

The mission of the School of Business and Economics at North Carolina A&T State University is to provide a high quality experience in management education in an academic environment which effectively recognizes, appreciates, and responds to the diverse backgrounds and abilities of students. The academic and related programs of the School are designed for the development and/or enhancement of communication, technological, analytical, team building, and other skills essential for graduates to competitively perform and advance in a changing and global society with a diverse work force. The School's primary emphasis on effective teaching and learning is fostered by the availability, continued improvement, and productivity of the faculty for instruction, advisement, research, and for service to the University, community, and the professions.

ACCREDITATION

The undergraduate accounting and business programs of the School of Business and Economics are accredited by the American Assembly of Collegiate Schools of Business (AACSB).

DEGREES OFFERED

Accounting - Bachelor of Science	Management - Bachelor of Science
Business Education, secondary - Bachelor of Science	Marketing - Bachelor of Science
Economics - Bachelor of Science	Office Administration - Bachelor of Science
Finance - Bachelor of Science	Transportation - Bachelor of Science

COURSE LOAD

The normal course load is fifteen to seventeen (15-17) credit hours. A full-time undergraduate student is required to carry a minimum of twelve (12) credit hours. Students majoring in the School of Business and Economics may not enroll for more than eighteen (18) credit hours without the approval of the Department Chairperson and the Dean.

GENERAL PROGRAM REQUIREMENTS

The student is held responsible for the selection of courses in conformity with the curriculum of his/her choice. A student who enters the School of Business and Economics has the privilege of graduating under the provisions of the *Bulletin* current upon admission provided all requirements are completed within six years. If all requirements are not completed within six years after admission, the student is expected to conform to the *Bulletin* requirements specified for the class with which graduation is anticipated.

The applicant for graduation must have earned a minimum of 124 semester hours, excluding deficiency and/or remedial course work, with a cumulative grade point average of 2.00 or better for all courses taken. Students in the School of Business and Economics must earn a minimum grade of "C" in ENGL 100, 101; MATH 111, 112; and, BUED 360. Students must also present a minimum cumulative grade point average of 2.00 in the major field of study which includes the minimum of a "C" grade in at least 8 (24 hours) of the 10 (30 hours)

courses listed as major program requirements in the applicable University *Bulletin* for the selected courses of study. (Economics majors should check program for major program requirements.)

Students are considered for a change of major to a program in the School of Business and Economics from other academic majors and undecided classification upon the completion of twenty-four (24) semester hours with a minimum Grade Point Average of 2.25. The 24 semester hours must include ENGL 100 and 101; MATH 111 and 112 or equivalent. FRST 098, FRST 099, FRST 100, and MATH 100 are not considered for the 24 hour requirement. Exceptions to this policy require the recommendation of the Department Chairperson and the approval of the Dean of the School of Business and Economics.

Students majoring in programs in the School of Business and Economics must elect 3 hours of humanities, social sciences, or free electives which satisfy the African-American studies core requirement of the University.

DOUBLE MAJOR

Students who desire to obtain a double major within the School of Business and Economics must complete a minimum of twelve (12) semester hours beyond those required of the first major. As a general rule, major program courses in one major in the School of Business and Economics will not be accepted to meet major program elective course requirements in the second major.

APPROVAL FOR TRANSFER CREDIT

Students enrolled in the School of Business & Economics must receive prior approval from the Department Chairperson and the Dean of the School of Business and Economics for courses to be considered for transfer credit from other colleges and universities.

PROFICIENCY EXAMINATIONS

Students who have had some training or experience in certain fields offered in the School of Business and Economics will be given an opportunity to take an examination with the permission of the Chairperson of the Department and the approval of the Dean of the School of Business and Economics. A student who passes a proficiency examination is given credit toward graduation, provided that the course is acceptable for his/her curriculum. Credit is given only if a grade of "C" is made on the examination. A grade of "P" is recorded on the student's record. No official record is made of failures on these examinations.

Proficiency examinations are given under the following restrictions:

1. Examinations may be taken only by persons who are in residence at the University.
2. Examinations may not be taken to raise grades or remove failures in courses.
3. Examinations may be taken only once in the same course.

SENIOR RESIDENCE REQUIREMENT

Students must complete a minimum of three semesters as a full-time student in residence at the University which includes the two semesters prior to graduation. At least one half of the student's credit hours in the major field must be earned at the University. Exception to either of these provisions may be made upon the recommendation of the Chairperson of the student's major department and the approval of the Dean of the School of Business and Economics.

SCHOOL REQUIREMENTS

All business programs require the completion of Business and Economics Core requirements including the following courses: ACCT 221, 222; BUED 360; BUAD 341, 422, 430, 461, 453, 481, 520; and, ECON 415, (BUAD 440 or BUAD 551 required for accounting majors.)

BETA GAMMA SIGMA

Beta Gamma Sigma is the national scholastic honor society for majors in programs in the School of Business and Economics. The North Carolina A&T State University Chapter was established in 1980 as a result of the accreditation of the undergraduate business programs in 1979. Membership is a signal honor and is limited to outstanding students who give promise of success in the field of business based upon their character and academic performance, and who rank in the upper 7 percent of the junior class or the upper 10 percent of the senior class.

Department of Accounting

Mark Kiel, Chairperson

OBJECTIVES

The successful practice of accounting today requires both technical competence in accounting and a thorough understanding of the economic environment in which accounting operates. Only by understanding the objectives and constraints of the economic environment is the accountant able to apply technical competence toward the solution of business problems. The objectives of the Accounting program are to present a broad exposure to the related business disciplines and to provide quality instruction, research in accounting and accounting education, and service to the community. The curriculum also provides the opportunity for interested students to prepare for the CPA Examination.

ACCREDITATION

The undergraduate accounting program is accredited by the American Assembly of Collegiate Schools of Business (AACSB).

DEGREE OFFERED

Accounting - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

The major in Accounting must complete a minimum of 124 semester hours consistent with the curriculum guide presented below. Accounting majors must earn a minimum grade of "C" in ENGL 100, 101, MATH 111, 112 and BUED 360.

DEPARTMENTAL REQUIREMENTS

Majors in the department must earn a minimum grade of "C" in at least 8 (24 hours) of the 10 (30 hours) courses listed as major program requirements for Accounting in the applicable University *Bulletin*. Also, students must earn a minimum grade of "C" in each of the following Accounting courses: ACCT 221, 222, 441, and 442.

CAREER OPPORTUNITIES

Students majoring in Accounting are prepared for careers in public and/or corporate accounting, business and government, and are provided with an appropriate background for graduate study.

CURRICULUM GUIDE FOR ACCOUNTING MAJORS*

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
POLI Elective ^{1 & 10}	3	Humanities Elective ⁴	3
Humanities Elective ^{2 & 10}	3	Natural Science Elective ³	3-4
Natural Science Elective ³	3-4	BUAD 220	3
PHED Elective ⁵	1	PHED Elective ⁵	1
	<u>17-18</u>		<u>17-18</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ACCT 221	3	ACCT 222	3
ECON 300	3	ECON 301	3
BUAD 341	3	ECON 310	3
ECON 305	3	BUED 360	3
PSYC 320	3	BUED 342 or 334	3
Free Elective ⁶	2	SPCH 250	3
	<u>17</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ACCT 441	3	ACCT 442	3
ACCT 444	3	ACCT 562	3
BUAD 422	3	BUAD 430	3
BUAD 453	3	BUAD 440 or 551	3
BUAD 481	3	BUAD 482	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ACCT 443	3	ACCT 561	3
ACCT 545	3	Accounting Electives ⁸	3
BUAD 461	3	BUAD 462 or BUAD 463 ⁹	3
Free Electives ^{7 & 10}	6	BUAD 520	3
	<u>15</u>		<u>12</u>

Total Credit Hours: 126-128

* All majors must earn a minimum grade of "C" in at least 8 (24 hours) of the 10 (30 hours) courses listed as major program requirements in the applicable University Bulletin for the selected area of study. Also, the student must earn a minimum grade of "C" in each of the following four accounting courses: 221, 222, 441, 442.

¹ POLI 200, 210, 220.

² Recommended Courses: MUSI 216, 220, 221; courses from Art; Foreign Language.

³ Recommended Courses: Biological Science 100; Physical Science 100; Introduction to Astronomy 101; Physics 110/111; EASC 201.

⁴ Recommended Courses: MUSI 216, 217, 220, 221; ENGL 103, 200, 201, 333; courses from Art; Foreign Language.

⁵ Recommended courses: PHED 107, 261, 344, 441.

⁶ Recommended courses: SPCH 116; ENGL 102; PHED 107, 261, 344, 441.

⁷ Recommended courses: ENGL 260, 300, 450; SPCH 351, 461; or additional courses in mathematics and computer science.

⁸ From ACCT 445, 590, and 643. Students planning to take the CPA Exam should elect ACCT 590 and/or 643. ACCT 446 may not be used as an elective for Accounting majors.

⁹ Students planning to take the CPA Exam should elect BUAD 463.

¹⁰ Students majoring in Accounting must elect 3 hours of humanities, political science, or free electives which satisfy the African-American studies core requirement for the University.

The Global Studies core requirement is met through the integration of global studies throughout the curriculum.

MAJOR PROGRAM REQUIREMENTS FOR ACCOUNTING MAJORS

Course & Number	Credit Hours	Course Title
ACCT 221	3	Principles of Accounting I
ACCT 222	3	Principles of Accounting II
ACCT 441	3	Intermediate Accounting I
ACCT 442	3	Intermediate Accounting II
ACCT 443	3	Income Tax Accounting
ACCT 444	3	Cost Accounting
ACCT 545	3	Advanced Accounting
ACCT 561	3	Auditing Principles
ACCT 562	3	Accounting Systems
BUAD 453	3	Business Finance

COURSES WITH DESCRIPTION IN ACCOUNTING

Undergraduate

ACCT-221. Principles of Accounting I

Credit 3(3-1)

Introduction to the basic records and procedures used by service and merchandising organizations in accumulating financial data with emphasis on statement presentation. Includes discussion of special problems of income measurement and asset valuation. Prerequisites: BUAD 220 and Sophomore standing.

ACCT-222. Principles of Accounting II

Credit 3(3-1)

Continuation of Principles of Accounting I. Emphasis on financial statement interpretation and the uses of accounting data by management for planning and control. Students are also introduced to the use of computers to maintain accounting records and to prepare financial statements. Prerequisite: Successful completion of ACCT 221.

ACCT-441. Intermediate Accounting I **Credit 3(3-1)**
Rigorous study of the methodology and underlying theory of financial accounting. In-depth analysis of valuation alternatives and their effect on income measurement. Prerequisites: Successful completion of ACCT 222 and Junior standing.

ACCT-442. Intermediate Accounting II **Credit 3(3-1)**
A continuation of Accounting 441. A study of accounting theory and techniques underlying the determination of contents and valuation of accounts for the financial statement of a going concern. Prerequisite: Successful completion of ACCT 441.

ACCT-443. Income Tax Accounting **Credit 3(3-1)**
Study of current principles and concepts of Federal Income Tax laws and related reporting requirements. The application of the tax structure and principles to selected accounting issues. Prerequisite: Junior standing or permission of instructor.

ACCT-444. Cost Accounting **Credit 3(3-1)**
Study of the principles and methodology of product and inventory cost determination and the effect on income measurement for manufacturing concerns, including job order and process costing under historical and standard cost systems. Special attention given to uses of accounting data as an aid in managerial planning and control. Prerequisites: Successful completion of ACCT 222 and Junior standing.

ACCT-445. Selected Topics in Accounting **Credit 3(3-1)**
Topics covered give additional consideration to selected accounting problems. Current accounting issues/problems and approaches to their resolution are examined. Governmental and not-for-profit topics are also considered. Prerequisites: Successful completion of ACCT 222 and Junior standing.

ACCT-446. Managerial Accounting **Credit 3(3-0)**
Development of accounting concepts and techniques as aids to management planning and control; including budgeting, cost behavior, cost-volume-profit analysis, and responsibility accounting for managerial decision making. Attention also given to the importance of ethics in the management account environment. Prerequisite: Successful completion of ACCT 222.

ACCT-545. Advanced Accounting **Credit 3(3-1)**
Covers partnerships, consignments, special sales contracts, consolidations with related computer applications, governmental accounting and other selected advanced accounting topics. Prerequisite: Successful completion of ACCT 441.

ACCT-561. Auditing Principles **Credit 3(3-1)**
Concentrates on the conceptual and practical aspects of the examination of financial statements by independent accountants within the framework of generally accepted accounting principles and generally accepted auditing standards. Appropriate attention is also given to the objectives and distinguishing characteristics of internal and operational auditing and to the importance and relevance of the Code of Professional Conduct. Prerequisite: Successful completion of ACCT 442.

ACCT-562. Accounting Systems **Credit 3(3-1)**
Focuses on current techniques of processing and utilizing accounting data for information systems with emphasis on the computer for internal control and reporting. Recognition also given to the appropriate ethical considerations in the development and reporting of accounting information. Prerequisite: Successful completion of ACCT 441.

ACCT-590. Seminar in Accounting Theory**Credit 3(3-1)**

The framework of ideas, concepts, and principles which make up the body of knowledge of accounting theory. Prerequisites: Successful completion of ACCT 442, Senior standing, and permission of instructor. Not recommended for Audit.

ACCT-643. Advanced Income Tax Accounting**Credit 3(3-1)**

Advanced treatment of tax rules, regulations, and application for individuals, partnerships, fiduciaries, and corporations. Students are also introduced to tax case research and the preparation of corporate tax returns utilizing the computer. Prerequisite: Successful completion of ACCT 443. Not recommended for Audit.

DIRECTORY OF FACULTY

Ronald Campbell, B.A., Oakwood College; M.B.A., Ohio State University; Ph.D., Texas A & M University; CPA; Assistant Professor

Mary Carrison, A.M., Sweet Briar College; M.B.A., Boston University; CPA, Instructor
Akhilesh Chandra, B. Com., M. Com., University of Delhi-India; Ph.D., Memphis State University; CMA; Assistant Professor

William D. Cooper, B. B.A., M.B.A., Georgia State University; Ph.D. University of Arkansas; CPA; Professor

Quiester Craig, B.A., Morehouse College; M.B.A., Atlanta University; Ph.D., University of Missouri at Columbia; CPA; Professor and Dean

Gloria M. Faucette, B.S., North Carolina A&T State University; MBA, Elon College; CPA, Instructor

Sharon G. Finney, B.S., North Carolina A&T State University; M. Acc., University of Illinois; Ph.D., Georgia State University; CPA; Assistant Professor

Lynn K. Griffin, B.S., West Chester State University; M.S., North Carolina State University; Ph.D., University of South Carolina at Columbia; CPA; Associate Professor

Gwendolyn Highsmith-Quick, B.S., North Carolina A&T State University; M.B.A., University of Wisconsin at Madison; Ph.D., University of Houston; CPA; Assistant Professor

Mark Kiel, B.S., Alabama State University; M.B.A., Atlanta University; Ph.D., University of Georgia; CPA; Associate Professor and Chairperson

Charles Malone, A.B., Boston University College of Liberal Arts; J. D., Boston University School of Law; M.B.A., Columbia University Graduate School of Business; Ph.D., University of Missouri; CPA; Assistant Professor

Gwendolyn McFadden-Wade, B.S., South Carolina State College; M. Acc., University of South Carolina; J. D., Stetson University College of Law; LL. M., University of Florida College of Law; CPA; Assistant Professor

Diana Robinson, B.S., North Carolina A&T State University; M.B.A., Duke University; CPA; Instructor

Ida Robinson, B.A., Fisk University; M.A., Columbia University; M.B.A., St. John's University; Ph.D. Oklahoma State University; CPA; Assistant Professor

Velma Simmons, B.S., North Carolina A&T State University; M.S., University of North Carolina-Greensboro; J. D., Wake Forest University School of Law; CPA; CMA; Assistant Professor

Margaret Smith, B.S., Duke University; M.B.A., Case Western Reserve University; Ph.D., Duke University; CPA; Assistant Professor

*Jerry Thorne, B.S., North Carolina A&T State University; M.B.A., University of Wisconsin at Madison; CPA; Instructor

* On leave, 1995-1996

Department of Business Administration

Melvin N. Johnson, Chairperson

OBJECTIVES

The objectives of the Business Administration Department are to provide fundamental knowledge concerning the field of business administration by emphasizing the tools essential for problem solving and decision making and to develop competencies necessary for accomplishing managerial goals.

DEGREES OFFERED

Finance - Bachelor of Science

Management - Bachelor of Science

Marketing - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

Students majoring in programs in the Department of Business Administration must complete a minimum of 124 hours consistent with the curriculum guide for the area of study selected. Business Administration majors must earn a minimum grade of "C" in ENGL 100, 101, MATH 111, 112, and BUED 360.

DEPARTMENTAL REQUIREMENTS

Students in the Department of Business Administration must select a degree program track in finance, management, or marketing. They must earn a minimum grade of "C" in 8 (24 hours) of the 10 (30 hours) courses identified as major program requirements in the applicable University Bulletin for the selected program track.

CAREER OPPORTUNITIES

Students earning a degree in Finance, Management or Marketing will acquire the technical preparation and competencies for challenging management careers in public, private, and entrepreneurial activity and for competitiveness in prestigious graduate programs.

CURRICULUM GUIDE FOR DEGREE PROGRAM MAJORS IN THE DEPARTMENT OF BUSINESS ADMINISTRATION

The following courses provide a background and basic knowledge for business necessary before selecting a degree program track.

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
Social Science Elective ¹	3	Social Science Elective ¹	3
Natural Science Elective ²	3-4	Natural Science Elective ²	3-4
MATH 111	4	MATH 112	4
BUAD 220	3	PHED Electives	3
	<u>16-17</u>		<u>16-17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 300	3	ECON 301	3
Humanities Elective ³	3	Humanities Elective ³	3
ECON 305	3	ECON 310	3
ACCT 221	3	ACCT 222	3
SPCH 250	3	BUAD 341	3
	<u>15</u>	PSYC 320	3
			<u>18</u>

¹ Recommended Courses: HIST 100, 101, 200, 215, 216, 310, 311; POLI 200, 210, 220; SOCI 100 and 200, 314.

² Recommended Courses: BIOL 100; CHEM 100; Introduction to Astronomy 101; Survey of Physics 110; Earth Science 201 (formerly Plant Science 201) — Plant Science 110 CANNOT be used as a Natural Science elective in the School of Business and Economics.

³ Recommended Courses: ENGL 200, 201, 203, 333; MUSI 216, 220, 221; and other courses from Art, Music and/or Literature; Foreign Languages including FOLA 417 (Literature of Afro-French Expression).

Degree Program: FINANCE

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 481	3	BUAD 482	3
BUAD 422	3	BUED 360	3
BUAD 453	3	BUAD 455	3
ACCT 441	3	ACCT 442	3
ECON 415	3	BUAD 550	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 430	3	BUAD 462	3
BUAD 461	3	BUAD 520	3
BUAD 551	3	BUAD 556	3
Finance Elective ⁴	3	Finance Elective ⁴	3
Non-business Elective	3	Non-business Elective	3
	<u>15</u>		<u>15</u>

Total Credit Hours: 125-127

⁴ Select two courses from the following: BUAD 464, BUAD 465, and BUAD 552, 553; ECON 410, 420, and 505, additional courses in Accounting or Computer Science in consultation with advisor.

MAJOR COURSE REQUIREMENTS FOR FINANCE MAJORS (0153)

Course & Number	Credit Hours	Course Title
BUAD 422	3	Management Concepts
BUAD 462	3	Business Law
BUAD 453	3	Business Finance
BUAD 455	3	Investments
BUAD 550	3	Financial Analysis
BUAD 551	3	Financial Management
BUAD 556	3	Financial Markets
ACCT 441	3	Intermediate Accounting I
ACCT 442	3	Intermediate Accounting II
ECON 310	3	Advanced Statistics

Degree Program: MANAGEMENT

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 481	3	BUAD 482	3
BUAD 422	3	BUED 360	3
BUAD 453	3	BUAD 426	3
ECON 415	3	BUAD 430	3
ACCT 446	<u>3</u>	BUAD 526	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 461	3	BUAD 520	3
BUAD 522	3	BUAD 462	3
Management Electives ⁵	3	Management Elective ⁵	3
Non-business Electives	3	Non-business Electives	<u>6</u>
BAUD 539	<u>3</u>		15
	15		

Total Credit Hours: 125-127

⁵ Select six hours from courses in the School of Business and Economics or additional courses in Computer Science or English and Speech with approval of advisor.

MAJOR COURSE REQUIREMENTS FOR MANAGEMENT MAJORS (0151)

Course & Number	Credit Hours	Course Title
ACCT 446	3	Managerial Accounting
BUAD 422	3	Management Concepts
BUAD 426	3	Organizational Behavior
BUAD 430	3	Marketing
BUAD 539	3	Marketing Management
BUAD 453	3	Business Finance
BUAD 481	3	Management Science
BUAD 482	3	Production Management
BUAD 522	3	Personnel Management
BUAD 526	3	International Management

Degree Program: MARKETING

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 481	3	BUAD 482	3
BUAD 430	3	BUAD 431	3
BUAD 422	3	BUAD 537 or BUAD 526	3
BUAD 453	3	BUAD 437	3
ACCT 446	<u>3</u>	BUED 360	<u>3</u>
	15		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 415	3	BUAD 520	3
BUAD 461	3	BUAD 462	3
BUAD 538	3	BUAD 539	3
Marketing Elective ⁶	3	Marketing Elective ⁶	3
Non-business Electives	<u>3</u>	Non-business Elective	<u>3</u>
	15		15

Total Credit Hours: 125-127

⁶ Select six credit hours from the following: BUAD 426; BUAD 433; BUAD 435; BUAD 440; BUAD 526 or BUAD 537; PSYC 420; courses in Transportation; Speech/English and Computer Science in consultation with advisor.

MAJOR COURSE REQUIREMENTS FOR MARKETING MAJORS (0152)

Course & Number	Credit Hours	Course Title
BUAD 422	3	Management Concepts
BUAD 430	3	Marketing
BUAD 431	3	Marketing Communications
BUAD 537 or 526	3	International Marketing/ International Management
BUAD 437	3	Consumer Behavior
BUAD 538	3	Marketing Research
BUAD 539	3	Marketing Management
BUAD 481	3	Management Science
ACCT 446	3	Managerial Accounting
ECON 310	3	Advanced Statistics

COURSES WITH DESCRIPTION IN BUSINESS ADMINISTRATION

BUAD-220. Business Environment **Credit 3(3-0)**

The purpose of this course is to provide an understanding of the evolution of America business and an appreciation of the growing responsibilities facing both the company and its leaders. This course also covers business functions, the nature and problems of establishing a business enterprise, elementary mathematical problems and computer concepts for business.

BUAD-341. Introduction to Management Information Systems **Credit 3(3-0)**

This course is an introduction to Management Information Systems (MIS) and its uses and impact on organizations. Primary emphasis is on enhancement of managerial decision making through analysis, development, design, and management of information systems. This course also includes an introduction to business software. Prerequisite: Sophomore standing.

BUAD-422. Management Concepts **Credit 3(3-0)**

This course covers an analysis of the basic managerial processes at the administrative, staff, and operational levels of a firm with consideration given to business ethics and social responsibility in both domestic and international environments. Appropriate attention is given to the role of organization theory as it applies to achieving managerial objectives through available tools for obtaining desired results. Prerequisite: Junior standing.

BUAD-425. Entrepreneurship **Credit 3(3-0)**

This course examines the unique aspects of small businesses. Attention will be given to competitive strategy, the regulatory environment, and sources of financing. The role of the small business within the macro economy is also explored. Prerequisite: Junior standing.

BUAD-426. Organizational Behavior **Credit 3(3-0)**

Introduction of behavioral concepts of concern to management. Emphasis is placed upon the analysis of interpersonal relations, communication practices, and morale factors relative to their effect upon productivity, organizational effectiveness, and personnel systems. Prerequisite: BUAD 422.

BUAD-430. Marketing **Credit 3(3-0)**

Marketing is a basic function in the firm and in the economy. Emphasis is placed on the relationship between marketing activities and the consumer. Includes functional, institutional, and ethical aspects of marketing in both domestic and international economics. Prerequisite: Junior standing.

BUAD-431. Marketing Communications**Credit 3(3-0)**

The purpose of this course is to acquaint students with the fundamentals of the marketing communications activities of the firm. All marketing mix variables are treated as marketing communications variables. Distinction is made between promotion and communications. Attention is also given to the usage of advertising communications appeals and marketing communications strategies in designing advertising and marketing communications programs. Prerequisite: BUAD 430.

BUAD-433. Retailing**Credit 3(3-0)**

Emphasis is on retail store management. Attention is given to store location, layout, personnel, organization, buying, inventory, sales promotion, customer services and operating expenses. Prerequisite: BUAD 430.

BUAD-435. Sales Management**Credit 3(3-0)**

Treats the fundamentals of planning, acquiring resources, organizing and directing activities associated with the sales function of an on-going enterprise. Prerequisite: BUAD 430.

BUAD-437. Consumer Behavior**Credit 3(3-0)**

Develops the knowledge of the behavioral content of marketing in consumer, industrial, and international fields. Examines the applicable theory, research findings, and concepts that are provided by psychology, sociology, anthropology, and marketing. The course stresses the conceptual models of buyer behavior based upon sources of influence: individual, group, culture environment. Prerequisite: BUAD 430.

BUAD-440. Business Information Systems**Credit 3(3-0)**

This course involves the evaluation of information systems. It includes three steps: (1) problem recognition; (2) system analysis (feasibility study), which involves collecting, organizing, evaluating facts about a system and the environment in which it operates; and (3) system design, in which a general outline of the proposed solution is used to produce a detailed design. Prerequisites: BUED 342 or CS 250, and Junior standing.

BUAD-453. Business Finance**Credit 3(3-0)**

An introduction to the financial problems of business organizations, the finance function and its relationship to other decision-making areas in the firm, the concepts and techniques for planning and managing the acquisition and allocation of financial resources from the standpoint of internal management. Prerequisites: ACCT 222 and Junior standing.

BUAD-455. Investments**Credit 3(3-0)**

Analyzes the various types of corporate and public securities, examines the operation of securities markets. Prerequisite: BUAD 453.

BUAD-461. Legal Environment of Business**Credit 3(3-0)**

An introduction to the legal system and environment in which business and the government operate. An examination of the creation of rights, liabilities, and regulations under the law as expressions of social and economic forces. Substantial coverage includes business organizations and society, administrative agencies, consumer protection, property ownership and contractual relations. Prerequisite: Junior standing.

BUAD-462. Business Law**Credit 3(3-0)**

Using the background provided in Business Administration 461, topics related to the legal implications activity will be continued. Coverage includes negotiable instruments, sales of goods, security and debt, bankruptcy, commercial papers and government regulation. Prerequisites: BUAD 461 and Senior standing.

BUAD-463. Commercial Law **Credit 3(3-1)**

The critical provisions of the Uniform Commercial Code will be examined in detail. Other topics will include anti-trust, security law, suretyship, professional liability, bulk transfers, and labor law. Prerequisites: BUAD 461 and Senior standing.

BUAD-464. Risk and Insurance **Credit 3(3-0)**

Introduction to risk management with emphasis on varied applications of insurance as a technique for treating uncertainty. Prerequisite: Junior standing.

BUAD-465. Real Estate **Credit 3(3-0)**

This course is a comprehensive introduction to real estate theory and practice. It is designed to enable the student to understand realty terminology and procedures. Topics include: realty law, leases, types of realty ownership, income tax law, sales contracts, mortgages estimating property value, negotiating, financing realty, closing procedures, closing costs, and deeds. This course provides background preparation for the real estate salesman's precicensing exam. Prerequisite: Junior standing.

BUAD-466. Real Estate Finance **Credit 3(3-0)**

Overview of real property financing; decision-making emphasis. Topics include present value calculations, underwriting residential and income property loans, mortgage law, kinds of mortgages, mortgage markets, and type of lenders. Prerequisites: BUAD 465, BUAD 453, or instructor consent.

BUAD-470. Urban Transportation Concepts **Credit 3(3-0)**

An analysis of the role of transportation in the urban scene. Topics covered include transportation needs of the poor, demand for the modes of transportation, and urban transportation planning methods. Prerequisite: Sophomore standing.

BUAD-481. Management Science I **Credit 3(3-0)**

An introduction to operations research. Basic concepts of management science including selected quantitative models applicable to management decisions involving production, marketing, and finance functions. Coverage will include analytical and theoretical techniques for production and job design, location and layout, scheduling, inventory, linear programming and network models. Prerequisites: Math 112 and ECON 305, and Junior standing.

BUAD-482. Production Management **Credit 3(3-0)**

A survey of the major production and operations functions of organizations with various productive systems. Stresses the identification of major problem areas associated with these functions such as aggregate planning, scheduling, man-machine systems, inventory control, etc., and the development of concepts and decisions processes for dealing with the problems. Emphasizes the application of modern quantitative techniques relevant to production management. Prerequisites: BUAD 481 and Junior standing.

BUAD-488. Systems Analysis

This course focuses on the analysis, design, selection, and construction phases using both the traditional systems development life cycle techniques and rapid application development techniques. In addition, such issues as the organizational structure of the Management Information Systems area and its relationship to other functional areas. Productivity tools for systems analysis and design, and preparation for a career in MIS are discussed. Prerequisite: BUAD 440.

BUAD-520. Business Policy**Credit 3(3-0)**

An integrative course that focuses on strategic planning, policy formulation, corporate-wide decision making. The terminal performance objectives of this course involve analysis of complex organization in order to develop the ability to: identify major problems and opportunities; to establish strategic objectives; and to recommend implementation plans and programs. Prerequisites: ACCT 222, BUAD 422, 430, 453; and, Senior standing.

BUAD-522. Personnel Management**Credit 3(3-0)**

The student is provided with various skills and techniques which are currently employed in the practice of personnel management. The course covers developments in programs and activities pertaining to the management of human resources with emphasis on the role of management. Topics include management's responsibilities in dealing with people, the role of personnel management, recruitment and selection, performance appraisal, the exercise of authority, and others. Prerequisite: Advanced Junior standing.

BUAD-524. Organizational Theory**Credit 3(3-0)**

The study of organizations. An examination of the basic managerial concepts of systems, organizational contingencies, conflict, and technology. Emphasis will be placed on design, authority, structure and effectiveness. The global environment and innovation will be considered. Prerequisites: BUAD 422 and Senior standing.

BUAD-526. International Business Management**Credit 3(3-0)**

The course is comprehensive in nature and covers all international business. Appropriate consideration is given to current topics and/or concerns in international business. Case and area studies approaches are utilized to make course more practical than theoretical. Projects emphasizing major issues in international business are assigned and discussed. Prerequisite: Senior standing.

BUAD-537. International Marketing**Credit 3(3-0)**

This course examines the application of marketing, management, and research, with appropriate consideration to institutional and environmental factors associated with international marketing. Case studies are used involving marketing concepts for the international scene. Prerequisite: BUAD 430.

BUAD-538. Marketing Research**Credit 3(3-0)**

Types of research techniques used by business coordinated marketing activities with consumer demand. Emphasis is placed upon survey, observational and experimental techniques used in marketing. Prerequisites: ECON 310 and BUAD 430.

BUAD-539. Marketing Management**Credit 3(3-0)**

A course to develop an understanding of marketing problems and to survey policies and procedures for the formation, execution and appraisal of marketing programs. Prerequisite: BUAD 430.

BUAD-550. Financial Analysis**Credit 3(3-0)**

The course focuses on short-term financial analysis processes and techniques for managing of current assets and liabilities. It emphasizes both practical and theoretical approaches for making optional decisions and includes consideration of appropriate policies and procedures to ensure continuity in decision making. Prerequisite: BUAD 453.

BUAD-551. Financial Management**Credit 3(3-0)**

This course concentrates on decisions involving long-term financial commitments and survival of the firm, including capital budgeting policies and procedures, capital structure, long-term financing and cost of capital. Practical approaches and theoretical models are used to examine domestic and multinational aspects. Prerequisite: BUAD 453.

BUAD-552. Commercial Bank Management **Credit 3(3-0)**

Analyzes the operations of commercial banks, specifically, and other major financial institutions in general. Emphasis is placed on management decision-making processes. Through case analysis and problems, the student is introduced to cash, loan, deposit, investment, and management problems faced daily by managers of financial institutions. Prerequisites: BUAD 453 and ECON 415.

BUAD-553. International Business Finance

This course provides a survey of fundamental issues in managing the financial operations of an international business unit. Topics include working capital management, capital budgeting, financial markets and instruments, and capital structure decisions. These issues are a framework of enhanced risk arising from currency fluctuations, political and regulatory differences, economics structure variations and culture. Prerequisite: BUAD 453.

BUAD-555. Securities Analysis and Management **Credit 3(3-0)**

This course treats in much greater depth the security analysis and portfolio management problems introduced in the basic investments course, BUAD 455. The treatment should be especially valuable for students preparing for careers which will involve (1) using or producing securities analyses and/or (2) managing securities portfolios. Usually this means working with a financial institution, although the market for these skills is much broader. Prerequisite: BUAD 455.

BUAD-556. Financial Markets **Credit 3(3-0)**

The course stresses the allocation, accumulation, and liquidity adjustment functions of financial markets. Financial tools such as flow and funds data, portfolio theory, theories of financial structure of interest rates, and security pricing (valuation) techniques will be integrated into the course. Prerequisites: BUAD 453 and ECON 415.

BUAD-557. Cases in Business Finance **Credit 3(3-0)**

A senior level course, designed for, but not restricted to, students who have a strong career interest in corporate financial management. The course utilizes cases and readings oriented toward short-term financial management problems. The student is placed continuously in the position of the decision-maker who must support his judgments by identifying each problem succinctly, marshaling appropriate data, analyzing the data, and ultimately arguing for one of the alternatives. Prerequisites: BUAD 550 or 551 and Senior standing.

BUAD-610. Interdisciplinary Seminar in Transportation **Credit 3(3-0)**

Geared to current developments in urban transportation; an interdisciplinary course on urbanism and transportation. Prerequisite: Advanced status in business administration, business education, accounting, economics, political science, sociology, or architectural engineering. Prerequisite: BUAD 470.

DIRECTORY OF FACULTY

Robert J. Angell, B.S. B.A., University of North Carolina at Chapel Hill; M.B.A., University of Virginia; D. B.A., Florida State University; Professor

Chiekwe Anyansi-Archibong, B.S., M.B.A., Ph.D., University of Kansas; Associate Professor
Willard R. Bagwell, B.S., University of North Carolina at Chapel Hill; M.B.A., Ph.D., Georgia State University; Associate Professor

Georgia W. Bowser, B.S. North Carolina Central University; M.S., Ph.D., University of Wisconsin at Madison; Associate Professor

Raphael O. Boyd, B.S., Atlantic Christian College; J. D., North Carolina Central University; M.B.A., Atlanta University; Adjunct Assistant Professor

Betty L. Brewer, B.S., East Carolina Univ., M.B.A., D. B.A., Kent State University; Associate Professor

James R. Brown, Jr., B.S., M.S., University of Tennessee; Ed. D., University of Georgia; Associate Professor

Susan K. DelVecchio, B.A., University of Pittsburgh; MBA, University of North Carolina at Greensboro; Ph.D., Virginia Polytechnic Institute and State University; Assistant Professor

Lawrence M. Glisson, B.S., M.A., East Carolina University; M.B.A., Ph.D., The American University; Professor

Alan J. Greco, B.S., Utica College of Syracuse University; MBA, State University of New York at Buffalo; D. B.A., Mississippi State University; Associate Professor

Rhonda L. Hensley, B.S., MBA, James Madison University; Ph.D., Virginia Commonwealth University; Adjunct Assistant Professor

Robert L. Howard, B.A., William College; M.B.A., University of Chicago; Ph.D., The Ohio State University; Associate Professor

Edna B. Johnson, B.S., Hampton University; M.S., University of Wisconsin; Ph.D., Florida State University; Assistant Professor

Melvin N. Johnson, B.S., North Carolina A&T State University; M.A., Ball State University; M.B.A., D. B.A., Indiana University; Associate Professor and Chairperson

Ravindra Krovi, B.S., University of Baroda; M.S., Memphis State University; Ph.D., Memphis State University; Assistant Professor

Mary R. Lind, B.S., Duke University; M.B.A., Ph.D., University of North Carolina at Chapel Hill; Associate Professor

Thaddeus McEwen, B.S., College of Arts, Science and Technology; M.S., Ph.D., Southern Illinois University at Carbondale; Associate Professor

Japhet H. Nkonge, B.A., North Carolina A&T State University; M.B.A., Rutgers University; Ph.D., University of North Carolina at Chapel Hill; Professor

Danny H. Pogue, B.A., Texas College; M.A., Texas Southern University; Ph.D., The Ohio State University; Associate Professor and Assistant Dean

Alonzo Redmon, B.S., University of Missouri at Columbia; M.B.A., Indiana University; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

Patrick Rogers, BSBA, MBA, Western Carolina University; Ph.D., University of Tennessee at Knoxville; Assistant Professor

Tapan Sen, B. Sc., M. Sc., Calcutta University; M.A., Eastern Illinois University; DBA, Texas Tech University; Professor

Janice Smith, B.S., Indiana University; M.B.A., Virginia Polytechnic Institute and State University; Ph.D., Virginia Polytechnic Institute and State University; Assistant Professor

Joanne M. Sulek, B.S., M.A., Wake Forest University; Ph.D., University of North Carolina at Chapel Hill; Associate Professor

George S. Swan, B.A., The Ohio State University; J. D., University of Notre Dame; LL. M., S. J. D., University of Toronto Faculty of Law; Associate Professor

Silvanus Udoka, B.S., Weber State University; M.S., Ph.D., Oklahoma State University; Assistant Professor

Isaiah O. Ugboro, B.S., Utah State University; M.B.A., Ph.D., University of North Texas; Associate Professor

Sharon White, B.A., University of Georgia; MBA, Florida State University; Ph.D., candidate, Florida State University; Assistant Professor

Department of Business Education and Administrative Services

Beryl McEwen, Chairperson

OBJECTIVES

The objectives of the Department of Business Education and Administrative Services are to provide quality instruction for the development of basic and comprehensive business teachers; and, to prepare students for managerial-level service roles in business, government, and the professions.

DEGREES OFFERED

Office Administration - Bachelor of Science

Business Education - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

Students majoring in Business Education acquire the essential competencies that Business and Office Education teachers need to function in an environment of changing technology. The Business Education program offers two tracks-Basic Business Education and Comprehensive Business Education. The Basic Business Education track emphasizes information systems and general business. In addition to the basic business concepts, the Comprehensive Business Education track is designed to prepare students with the methods and skills essential for disseminating knowledge about office procedures, office technology, keyboarding, and office layout/design at the secondary level. Both tracks emphasize professional skills, techniques, and teaching and learning methodologies applicable to Business Education.

Business Education majors also complete courses for a second academic concentration. Options include economics, mathematics and other selected majors. Details of this major should be discussed with the chairperson of the Department of Business Education and Administrative Services.

The Office Administration program prepares students for administrative management careers in government, business, and the professions. Students majoring in programs in the Department of Business Education and Administrative Services must complete 124-128 semester hours consistent with the curriculum guide for the program selected. Business Education and Administrative Services majors must earn a minimum grade of "C" in ENGL 100, 101, MATH 111, 112, BUED 360.

DEPARTMENTAL REQUIREMENTS

Majors in the Department of Business Education and Administrative Services must earn a minimum grade of "C" in 8 (24 hours) of the 10 (30 hours) courses identified as major program requirements in the applicable University Bulletin for the selected area of study.

The curriculum meets the certification requirements for the North Carolina Department of Public Instruction. The Business Education and Administrative Services Department will be guided by the State's certification procedure in force.¹ Each student is required to pass the communication skills, general knowledge, and professional education components as well as the Specialty Area Test of the National Teacher Examination for initial certification. Check with your advisor or chairperson for details.

Business Teacher Education majors must meet the relevant admission, retention, and exit criteria for the Teacher Education Program. For more details, see "Teacher Education

Program” and “Teacher Education Admission and Retention Standards, Including Certification Procedures” sections in this Bulletin.

To be eligible for student teaching in both Comprehensive Business Education and Basic Business Education, the student must have met the following requirements:

1. Senior Standing
2. Completed three-fourths of the number of hours required in basic business and economic courses
3. Completed three-fourths of the number of hours required in his/her subject matter major
4. Attained an average of 2.5 or better in all work undertaken in the University, in all professional education courses undertaken, and in all courses undertaken in the subject matter major
5. Admitted to the Teacher Education Program

¹ *Business Teacher Education majors must meet the relevant admission, retention, and exit criteria for the Teacher Education Program.*

ACCREDITATION

Business Teacher Education programs are accredited by the National Council for Accreditation of Teacher Education and approved by the State Department of Public Instruction. Both the Business Education and the Office Administration programs are included in the undergraduate accreditation of the business programs by the American Assembly of Collegiate Schools of Business.

CAREER OPPORTUNITIES

Depending on the major selected, graduates of the Department of Business Education and Administrative Services are qualified for career opportunities as business teachers in middle and secondary grades, administrative assistants, office administrators, and other managerial personnel in business, industry, and the government.

CURRICULUM GUIDE FOR BUSINESS EDUCATION (Basic/Economics Track)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
Natural Science Electives ¹	4	Natural Science Electives ²	3
PHED 200	2	ENGL 200	3
BUAD 220	3	BUED 302 ³	2
	<hr/> 16	PHED Elective	<hr/> 1
			16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 201	3	ACCT 222	3
ACCT 221	3	SPCH 250	3
ECON 300	3	CUIN 300	2
ECON 305	3	ECON 301	3
PSYC 320	3	ECON 310	3
BUED 334	3	BUAD 341	3
	<u>18</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 301	2	BUED 360	3
BUED 342	3	CUIN 400	3
ECON 410	3	ECON 420	3
BUAD 422	2	BUAD 430	3
BAUD 481	3	BUAD 453	3
Free Elective	3	BUED 670 or 671	1
BUED 670 or 671	1		<u>16</u>
	<u>17</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 415	3	CUIN 500	3
BUAD 461	3	CUIN 560	6
BUAD 520	3	CUIN 624	3
BUED 575	3		<u>12</u>
BUED 682	3		
	<u>15</u>		

Total Credit Hours: 127

¹ Recommended Courses: BIOL 100-Biological Science; BIOL 140-General Botany; BIOL 160-General Zoology; CHEM 101-111-General Chemistry and Lab; CHEM 100-110-Physical Science Lab

² Recommended courses: EASC 201-The Earth-Man's Environment; PHYS 101-Introduction to Astronomy; PHYS 110-111-Survey of Physics Lab

³ Students who do not pass the Proficiency Test for Beginning Typewriting should enroll in BUED 301, the prerequisite for BUED 302.

PROGRAM REQUIREMENTS FOR BUSINESS EDUCATION
(Basic/Economics Track)

Course & Number	Credit Hours	Course Title
BUAD 341	3	Introduction to Management Information Systems
BUAD 461	3	Legal Environment of Business
BUED 334	3	Microcomputer usage in Business
BUED 342	3	Business Programming (COBOL)
BUED 360	3	Business Communications
BUED 575	3	Methods of Teaching Business Subjects
BUED 682	3	Administration and Supervision in Business Educ.
ECON 410	3	Intermediate Microeconomic Theory
ECON 415	3	Money and Banking
ECON 420	3	National Income Analysis

CURRICULUM GUIDE FOR BUSINESS EDUCATION
(Comprehensive/Economics Track)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
Natural Science Elective ¹	3	Natural Science Elective ²	3
PHED 200	2	ENGL 200	3
BUAD 220	3	BUED 302 ³	2
PHED Elective	<u>1</u>	PHED Elective	<u>1</u>
	16		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 300	3	ACCT 222	3
ACCT 221	3	ECON 310	3
ENGL 201	3	ECON 301	3
SPCH 250	3	CUIN 300	2
ECON 305	3	BUED 332 ³	3
BUED 334	<u>3</u>	BUAD 341	<u>3</u>
	18		17

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUED 342	3	BUAD 453	3
BUAD 422	3	BUAD 430	3
CUIN 301	2	ECON 415	3
BUAD 481	3	CUIN 400	3
PSYC 320	3	BUED 360	3
ECON 410	3	BUED 670 or 671	1
	<u>17</u>		<u>16</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUED 682	3	CUIN 500	3
ECON 420	3	CUIN 560	3
BUAD 461	3	CUIN 624	6
BUED 575	3		<u>12</u>
BUAD 520	3		
BUED 670 or 671	1		
	<u>16</u>		

Total Credit Hours: 128

PROGRAM REQUIREMENTS FOR BUSINESS EDUC. (Comprehensive/Economics Track)

Course & Number	Credit Hours	Course Title
BUAD 341	3	Introduction to Management Information Systems
BUAD 461	3	Legal Environment of Business
BUED 332	3	Shorthand II
BUED 342	3	Business Programming (COBOL)
BUED 360	3	Business Communications
BUED 575	3	Methods of Teaching Business Subjects
BUED 682	3	Administration and Supervision in Business Educ.
ECON 410	3	Intermediate Microeconomics Theory
ECON 415	3	Money and Banking
ECON 420	3	National Income Analysis

¹ Recommended Courses: BIOL 100-Biological Science; BIOL 140-General Botany; BIOL 160-General Zoology; CHEM 101-111-General Chemistry and Lab; CHEM 100-110-Physical Science Lab

² Recommended courses: EASC 201-The Earth-Man's Environment; PHYS 101-Introduction to Astronomy; PHYS 110-111-Survey of Physics Lab

³ Students who do not pass the Proficiency Test for Beginning Typewriting should enroll in BUED 301, the prerequisite for BUED 302.

CURRICULUM GUIDE FOR OFFICE ADMINISTRATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
Natural Science Elective ¹	3-4	Natural Science Elective ²	3
BUAD 220	3	BUED 302 ³	2
Social Science Elective ⁴	3	Social Science Elective ⁴	3
	<u>16-17</u>	PHED Elective	<u>2</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Humanities Elective ⁵	3	Humanities Elective ⁵	3
PSYC 320	3	BUED 342	3
ACCT 221	3	ACCT 222	3
BUED 334	3	SPCH 250	3
ECON 300	3	BUED 332 ⁶	3
BUAD 341	3	ECON 301	3
	<u>18</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 453	3	BUAD 461	3
ECON 305	3	ECON 310	3
BUED 360	3	BUAD 426	3
BUAD 422	3	BUAD 430	3
BUAD 440	3	BUED 400	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 481	3	BUAD 520	3
SPCH 351 or ENGL 260	3	BUAD 522	3
BUED 670 or 671	1	Free Electives (non-business)	<u>6</u>
BUED 568	3		12
ECON 415	3		
Free Elective	3		
	<u>16</u>		

Total Credit Hours: 127-128

PROGRAM REQUIREMENTS FOR OFFICE ADMINISTRATION

Course & Number	Credit Hours	Course Title
BUAD 341	3	Introduction to Management Information Systems
BUAD 422	3	Management Concepts
BUAD 426	3	Organizational Behavior
BUAD 440	3	Business Information Systems
BUAD 522	3	Personnel Management
BUED 342	3	Business Programming
BUED 360	3	Business Communications
BUED 400	3	Business Reports and Presentations
BUED 568	3	Office Automation
ECON 305	3	Elementary Statistics

¹ *Recommended Courses: BIOL 100-Biological Science; BIOL 140-General Botany; BIOL 160-General Zoology; CHEM 101-111-General Chemistry and Lab; CHEM 100-110-Physical Science Lab*

² *Recommended courses: EASC 201-The Earth-Man's Environment; PHYS 101-Introduction to Astronomy; PHYS 110-111-Survey of Physics Lab*

³ *Students who do not pass the Proficiency Test for Beginning Typewriting should enroll in BUED 301, the prerequisite for BUED 302.*

⁴ *Recommended courses: HIST 100, 101, 215, 216, 310, 311. Geography (HIST 200 and 322). POLI 200, 210, 220; SOCI 100 and 200.*

⁵ *Recommended courses: ENGL 200, 201, 202, 203, 333; MUSI 216, 220, 221; other courses from Art, Music, and/or Literature; Foreign Languages*

⁶ *Students who do not pass the proficiency test for Shorthand I should enroll in BUED 331, the prerequisite for BUED 332*

COURSES WITH DESCRIPTION IN BUSINESS EDUCATION AND ADMINISTRATIVE SERVICES

BUED-301. Introduction to Keyboarding **Credit 2(1-2)**

This course is designed to develop speed and accuracy in using keyboards. Emphasis is placed on using keyboarding software for formatting simple documents. Requirements for successful completion: 45 gross words per minute.

BUED-302. Intermediate Keyboarding **Credit 2(1-2)**

This course is designed to increase keyboarding speed and accuracy. Emphasis is placed on the production of letters, memoranda, and reports to develop technical keyboarding skills. Requirements for successful completion: 60 gross words per minute.

BUED-331. Gregg Shorthand I **Credit 3(2-1)**

Study of theory as outlined in Gregg Shorthand Diamond Jubilee Series. Minimum terminal requirement: 70 wpm on practiced matter. Prerequisite: BUED 302.

BUED-332. Gregg Shorthand II **Credit 3(2-1)**

Emphasis is placed on reinforcing shorthand theory as outlined in Gregg Shorthand Diamond Jubilee Series, speed building, and production of mailable letters. Minimum terminal requirement: 80 wpm on new-matter dictation. Prerequisites: BUED 302 and 331.

BUED-334. Microcomputer Usage in Business**Credit 3(2-1)**

The theory and application of microcomputers in business. Hands-on experience with microcomputers using commercially and noncommercially developed software as it relates to the business environment. Prerequisite: Sophomore standing.

BUED-342. Business Programming**Credit 3(3-0)**

An introduction to computer programming design and techniques for management decision-making. Emphasis on the computer as an aid to problem solving and report generation essential to an efficient and an effective management information system. Prerequisite: BUAD 341 or equivalent.

BUED-360. Business Communications**Credit 3(3-0)**

The study of communication theory and its applications to business. Emphasis is placed on composing the basic forms of business communication, including correspondence and reports. Attention is also given to the ethical objectives of communicating in the managerial environment. Prerequisite: ENGL 101. Sophomore standing.

BUED-379. Personal Finance**Credit 3(3-0)**

Treats the problems faced by individuals in managing personal incomes and expenditures. Emphasis is also placed upon credit, budgeting, borrowing, saving, and insurance. Prerequisite: Sophomore standing.

BUED-400. Business Reports and Presentations**Credit 3(3-0)**

Business Reports and Presentations is a one-semester course with emphasis on advanced applications of business and technical writing principles; short reports such as letter reports and memo reports; formal reports; proposals; and procedures manuals. Emphasis will be placed on research and formal writing skills and on oral presentation skills through presentation of various reports. Presentations will be enhanced by using a graphic software package (such as Harvard Graphics) and a word processing package (such as WordPerfect) for document preparation. Prerequisites: ENGL 100, 101, SPCH 250, BUED 360; or Junior standing and approval of the chairperson.

BUED-447. Word Processing Concepts and Applications**Credit 3(2-1)**

Emphasis on the basic concepts of word processing. Treatment of topics including specialized word processing personnel, work measurement and log-in procedures, terminology, and keyboarding applications. Prerequisite: BUED 302 and BUED 334 or permission of instructor.

BUED-568. Office Automation**Credit 3(3-0)**

Emphasis is given to information processing considerations at the systems level including analysis and management of support activities such as data and records management, word processing, micro- and reprographics, and (tele-) communications. Includes the use of microcomputers and discussion of person/machine interfaces and appraisals of current and future technological trends and their impact on information processing and on the office environment. Prerequisite: BUAD 341 or equivalent and Senior standing.

BUED-573. Executory Administration**Credit 3(3-0)**

Executory Administration represents a problem-solving, decision-making approach to office management. It is built around the case method and each case provides the opportunity to utilize previously acquired knowledge and skills in the areas of business and administrative support duties. Also included in the course is a module on records management. Prerequisites: BUED 302, 332, 334, 360, and Senior standing or permission of instructor.

BUED-575. Methods of Teaching the Business Subjects**(Basic and Comprehensive)****Credit 3(3-1)**

Selection, organization, and evaluation of supplementary teaching materials and analysis of techniques in teaching typewriting, shorthand, transcription, related office skills, data processing, accounting, general business, business law, business structure, and elementary economics. Construction of teaching units, enrichment materials, and lesson plans for effective teaching at the secondary level. Provisions are made for observation and participation in demonstrative teaching. Prerequisites: CUIN 300-301, 400; PSYC 320; BUED 302, 334, and Senior standing.

BUED-664. Occupational Exploration for Middle Grades**Credit 3(3-0)**

Designed for persons who teach or plan to teach middle grades occupational exploration programs. Emphasis is placed on occupational exploration in the curriculum, sources and uses of occupational information, approaches to middle grades teaching, and philosophy and concepts of occupational education.

BUED-665. Occupational Exploration in the Middle Grades-**Business and Office Occupations****Credit 3(3-0)**

Emphasis is placed on curriculum, methods and techniques of teaching and resources and facilities for teaching in the business and office occupations cluster including business and office, distribution and marketing, and communication and media.

BUED-670, 671, and 672. Directed Work Experience**Credit 1(0-1)**

Observation and field work in selected business firms to contribute practically to the total development of the student's educational experiences. A minimum of 100 hours must be completed each semester. Two hundred and fifty hours are required for Business Teacher Education majors. Students will receive "S" for "Satisfactory" or "U" for "Unsatisfactory" grades. Prerequisite: Junior standing.

BUED-682. Administration and Supervision of Business and**Office Education****Credit 3(3-0)**

Understanding of the principles of effective administration and supervision of programs sponsored by federal vocational legislation and administered by state and local boards of education; functions of state plans; and study of (1) program standards, (2) administrative and supervision and evaluation, and (3) administrative and supervisory duties and problems (including inventories, equipment, co-curricular activities, public relations, departmental records, and staffing.) The role and responsibility of the coordinator of occupational educational systems and examination of pertinent research and procedures in job analyses. Prerequisite: Senior standing and consultation with adviser.

DIRECTORY OF FACULTY

Lillie Anderton-Lewis, B.A., Howard University; M.S., Ph.D., Virginia Polytechnic Institute and State University; Assistant Professor

Frank W. Griffin, B.A., University of North Carolina at Chapel Hill; M.A., North Carolina State University, Ph.D., University of North Carolina at Greensboro; Adjunct Assistant Professor

Sandra Howard, B.S., University of District of Columbia; M.S., North Carolina A&T State University; Ed. D., University of North Carolina at Greensboro; Assistant Professor

Jack Hulbert, B.S., Paterson State College; M.B.A., Ph.D., Indiana University; Professor

Thelma M. King, B.S., North Carolina A&T State University; M.S., University of North Carolina at Greensboro; Ph.D., Virginia Polytechnic Institute and State University; Assistant Professor

Ewuukgem Lomo-David, B.S., Mankato State University; M. Ed., Ed. D., Memphis State University; Assistant Professor

Beryl McEwen, B.S., College of Arts, Science and Technology; M.S., Ph.D., Southern Illinois University at Carbondale; Associate Professor and Chairperson

Francisca Norales, B.S., Andrews University; M.A., Ed. D., Ball State University; Assistant Professor

Linda Tucker, B.S., North Carolina A&T State University; M.S., North Carolina Central University; Instructor

Department of Economics

Michael Simmons, Chairperson

OBJECTIVES

The objectives of the Department of Economics are to develop the student's ability to understand and use economic principles and concepts to identify, analyze, and solve problems associated with the economy, and to develop potential for leadership positions in business, education, and the government.

DEGREES OFFERED

Economics - Bachelor of Science

Transportation - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

Two program options are available to majors in Economics: (1) Business Economics and (2) General Economics. The business-oriented option includes the same core courses required of all Business Administration and Accounting majors in the School of Business and Economics. In the general option, the student is allowed 27 hours in free electives in order to develop other areas of interest, such as computer science or preparation for graduate study or law school.

Economics and Transportation majors are required to complete a minimum of 124 hours for a baccalaureate degree consistent with the curriculum guide for the program selected. Also, a minimum grade of "C" must be earned in ENGL 100, ENGL 101, BUED 360, MATH 111, and MATH 112.

DEPARTMENTAL REQUIREMENTS

Students majoring in Economics must earn a minimum grade of "C" in all Economics courses listed as Major Program Requirements. Economics 300 and 301 are prerequisite to all courses in Economics. Transportation majors must earn a minimum grade of "C" in 8 (24 hours) of the 10 (30 hours) courses identified as major program requirements.

CAREER OPPORTUNITIES

The Economics major is prepared for careers in government services, business, and industry and is provided with the educational background for graduate study and the study of law. The Transportation major is prepared for careers in carrier and physical distribution management with railroads, motor lines, water carriers, airlines, other industries and the government.

CURRICULUM GUIDE FOR THE MAJOR IN ECONOMICS (Business Emphasis)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111 ¹	4	MATH 112 ²	4
Social Science Elective	3	Social Science Elective	3
BIOL Science	4	PHYS Science	4
PHED	1	BUAD 220	<u>3</u>
PHED 200	<u>2</u>		<u>17</u>
	17		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ACCT 221	3	ACCT 222	3
SPCH 250	3	Humanities Elective	3
Humanities Elective	3	BUAD 341	3
PSYC 320	3	ECON 301	3
ECON 300	3	ECON 310	<u>3</u>
ECON 305	<u>3</u>		<u>15</u>
	18		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 430	3	BUAD 453	3
FOLA Elective	3	FOLA Elective	3
BUAD 422	3	ECON 415	3
ECON 410	3	ECON 420	3
ECON 412	<u>3</u>	BUED 360	<u>3</u>
	15		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 481	3	BUAD 520	3
BUAD 461	3	ECON 525	3
Economics Elective	3	Economics Elective	3
Electives (non-business and non-economics)	<u>6</u>	Electives (non-business and non-economics)	<u>6</u>
	15		<u>15</u>

Total Credit Hours: 127

**PROGRAM REQUIREMENTS FOR ECONOMICS MAJORS
(Business Emphasis)**

Course & Number	Credit Hours	Course Title
ECON 300	3	Principles of Economics (Micro)
ECON 301	3	Principles of Economics (Macro)
ECON 305	3	Elementary Statistics
ECON 310	3	Advanced Statistics
ECON 410	3	Intermediate Microeconomic Theory
ECON 412	3	Quantitative Analysis
ECON 415	3	Money and Banking
ECON 420	3	National Income Analysis
ECON 525	3	Economics Seminar
BUAD 341	3	Introduction to Management Information Systems

¹ Transfer students who have completed MATH 101 and 102 with a "C" or better may substitute those classes for MATH 111.

² It is recommended that students considering Graduate School take MATH 131 and MATH 132 in place of MATH 112.

CURRICULUM GUIDE FOR THE MAJOR IN ECONOMICS (GENERAL)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111 ¹	4	MATH 112 ²	4
Social Science Elective	3	Social Science Elective	3
BIOL Science	4	Natural Science Elective	4
PHED Elective	1	BUAD 220	3
PHED 200	2		<u>17</u>
	<u>17</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 305	3	ECON 310	3
Humanities Elective	3	BUAD 341 or MATH 240	3
ECON 300	3	Humanities Elective	3
PSYC 320	3	ECON 301	3
SPCH 250	3	Social Science Elective	3
	<u>15</u>		<u>15</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
FOLA Elective	3	FOLA Elective	3
ECON 410	3	ECON 420	3
ECON 412	3	ECON Elective	3
ECON Elective	3	ECON 415	3
Social Science or Math Elective	3	BUED 360	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Electives ³	15	Economics 525	3
	<u>15</u>	Electives	<u>12</u>
			15

Total Credit Hours: 124

PROGRAM REQUIREMENTS FOR ECONOMICS MAJORS

Course & Number	Credit Hours	Course Title
ECON 300	3	Principles of Economics (Micro)
ECON 301	3	Principles of Economics (Macro)
ECON 305	3	Elementary Statistics
ECON 310	3	Advanced Statistics
ECON 410	3	Intermediate Microeconomic Theory
ECON 412	3	Quantitative Analysis
ECON 415	3	Money and Banking
ECON 420	3	National Income Analysis
ECON 525	3	Economics Seminar
BUAD 341	3	Introduction to Management Information Systems ¹
		or
MATH 240	3	Introduction to the Programming of Digital Computers

¹ Transfer students who have completed MATH 101 and 102 with a "C" or better may substitute those classes for MATH 111.

² It is recommended that students considering Graduate School take MATH 131 and MATH 132 in place of MATH 112.

³ Fifteen (15) semester hours should be taken from the following disciplines: Computer Science, Mathematics, Business Administration, Accounting, Political Science, Agricultural Economics, Sociology, Anthropology, English or Education in consultation with adviser.

MANPOWER OPTION FOR ECONOMICS MAJORS

The Department of Economics offers a manpower option which provides an understanding of manpower planning, manpower program evaluation, and manpower administration. In this option, students gain expertise in coping with problems of employment and additional skills for careers in state, city and county government, federal agencies, private industry, as well as community manpower agencies.

Students interested in the manpower concentration should complete the following core courses: ECON 305 or PSYC 322; ECON 602, 603; BUAD 522; SOCI 302, 501 or 601; and PSYC 445. Two electives (6 hours) must be selected in consultation with the appropriate adviser.

CURRICULUM GUIDE FOR TRANSPORTATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
Natural Science Elective	3	Natural Science Elective	3-4
Social Science Elective	3	Social Science Elective	3
BUAD 220	3	Humanities Elective	3
PHED Elective	1	PHED Elective	1
	<u>17</u>		<u>17-18</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 300	3	ECON 301	3
Humanities Elective	3	ACCT 222	3
SPCH 250	3	ECON 310	3
ACCT 221	3	BUAD 341	3
ECON 305	3	PSYC 320	3
TRAN 360	3		<u>15</u>
	<u>18</u>		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 422	3	BUAD 430	3
BUAD 481	3	BUAD 453	3
ECON 425	3	TRAN 460	3
TRAN 440	3	ECON 430	3
TRAN 450	3	BUED 360	3
	<u>15</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BUAD 461	3	BUAD 520	3
TRAN 570	3	Electives (non-business and non-economics)	3
Electives (non-business and non-economics)	6	TRAN 572	3
TRAN Elective	3	TRAN 660	3
	<u>15</u>		<u>12</u>

Total Credit Hours: 124-125

MAJOR PROGRAM REQUIREMENTS TRANSPORTATION MAJORS

Course & Number	Credit Hours	Course Title
TRAN 360	3	Introduction to Transportation
TRAN 440	3	Introduction to Logistics
TRAN 450	3	Carrier Management
TRAN 460	3	Traffic Management
TRAN 570	3	Materials Management
TRAN 572	3	Procurement and Purchasing
TRAN 660	3	National Transportation Policy
ECON 430	3	Computer Analysis of Bus. and Econ. Data
ECON 425	3	Economics of Transportation
BUAD 481	3	Management Science

TRANSPORTATION ELECTIVES:

(One elective must be completed from the courses listed below)

ECON 599	3	Independent Study
TRAN 650	3	Transportation Law
BUAD 470	3	Urban Concepts
TRAN 610	3	Interdisciplinary Seminar in Transportation

UPS ENDOWED CHAIR

Established to provide faculty support for curriculum and student development; and, to enhance research and other scholarly activities in transportation.

TRANSPORTATION MINOR

The Department of Economics administers a minor in Transportation which provides an understanding of urban and rural transportation planning with a special emphasis on public transport. In this minor, students are prepared for careers in transportation agencies of federal, state, county and city governments or in related private industry. Any major within the University may complete the requirements of this minor.

Students interested in the transportation minor must successfully complete 18 semester hours from the following courses:

BUAD 470, ECON 425; Twelve (12) hours of electives from POLI 448; MEEN 461 and 462; ARCH 566 and 567; ELEN 660; BUAD 610.

TRANSPORTATION INSTITUTE

The Transportation Institute draws faculty, staff members and students from a number of different departments to create an interdisciplinary unit that conducts research, public service and training programs in the field of transportation. It also serves as a resource for planners, social scientists, public officials, and community groups in helping them solve transportation problems.

The research program covers a wide range of areas, from investigating transportation needs of the poor to analyzing transportation financing. The Institute has achieved a national reputation for its funded research in small city and rural transportation.

Students play an important role in each of the research projects. Under the guidance of the faculty, student research assistants help in developing and conducting funded projects awarded to the Transportation Institute. The Institute makes substantial financial awards to students who are awarded research assistantships.

The Institute is a regional center which offers seminars, workshops, and short courses designed to provide instruction in current techniques and transportation concepts. These programs are designed for individuals outside the University who have an interest in transportation. In addition they may use the extensive resource collection in transportation which is housed in the Transportation Institute facilities, located in Merrick Hall.

COURSES WITH DESCRIPTION IN ECONOMICS AND TRANSPORTATION

ECON-300. Principles of Economics (Micro) Credit 3(3-0)

An introduction to the principles of economics as they relate to individual segments of the society. Emphasis will be placed upon scarcity, supply and demand, consumer behavior, business firms and market structures.

ECON-301. Principles of Economics (Macro) Credit 3(3-0)

An introduction to the principles of economics as they apply to the economy as a whole. National income determination, inflation, unemployment, monetary and fiscal policies, and the basics of international economic relations are covered.

ECON-305. Elementary Statistics Credit 3(3-1)

An introduction to descriptive statistics including tabular and graphic presentation of data, measures of central tendency and of dispersion; index numbers; probability; probability distributions; sample design and sampling distributions; and estimation. Prerequisite: MATH 111.

ECON-310. Advanced Statistics Credit 3(3-1)

Introduction to inferential statistics including classical hypothesis testing, chi-square tests and analysis of variances; regression analysis; correlation analysis; time series analysis; and decision theory. Prerequisite: ECON 305.

ECON-401. Public Finance Credit 3(3-0)

Analysis is made of the way federal, state, and local governments obtain and spend their revenues. Tax theories, incidence and impact are covered. Factors influencing governmental fiscal policies.

ECON-405. History of Economic Thought Credit 3(3-0)

A survey of the history of economic thought from the Middle Ages to John M. Keynes. The course aims to show how, and under what conditions the more important laws and theories have become a part of the body of modern economics.

ECON-410. Intermediate Microeconomic Theory Credit 3(3-0)

Theoretical analysis of consumer demand; production and costs; optimum output and pricing behavior under various market conditions; allocation of factors of production and distribution of income; general equilibrium and welfare economics. Prerequisites: ECON 300 and Junior standing.

ECON-412. Quantitative Analysis Credit 3(3-0)

This course is intended to provide students with a solid foundation to basic mathematical methods employed in macro and micro economic theory. It includes elementary application of calculus and analytical geometry, and matrix algebra to illustrate income - expenditure model, demand theory, production function, problems of cost minimization and profit maximization, and linear programming. Prerequisites: ECON 300, 301; MATH 111, 112 or 131.

ECON-415. Money and Banking**Credit 3(3-0)**

An introduction to money, banking, and recent developments in the U. S. financial system. The functions and definitions of money, various types of financial intermediaries and instruments, commercial banking and credit creation, the Federal Reserve System, monetary theory and policy, and international banking are covered. Prerequisites: ECON 300 and 301, Junior standing.

ECON-420. National Income Analysis**Credit 3(3-0)**

An intermediate level exploration of macroeconomic phenomena. Topics include aggregate demand and supply, income determination, equilibria in money and commodity markets, expectations theories, consumption, investment, inflation and unemployment trade-off, and monetary and fiscal policies for stabilization. Prerequisites: ECON 301 and Junior standing.

ECON-425. Economics of Transportation**Credit 3(3-0)**

Application of the tools of economics to problems of the transportation industry. Topics include economic regulation, cost-benefit, rate structure, externalities and social vs. individual decision making.

ECON-430. Computer Analysis of Business and Economic Data**Credit 3(3-0)**

Introduction to the use of interactive and Batch systems for analysis of business and economic data; using statistical packages and the use of computer for computation of measures of central tendency, measures of dispersion, correlation, testing hypothesis, chi-square, t and F statistics, and linear regression. Emphasis on structured use of FORTRAN in implementing packages. Prerequisite: ECON 310.

ECON-501. Labor Problems**Credit 3(3-0)**

An introductory course focusing on dealing with the efforts of working people to improve their relative position in the economy; the influence of unionism and of government participation are emphasized.

ECON-505. International Economic Relations**Credit 3(3-0)**

National specialization and international exchange. The history and significance of international trade among nations of the world.

ECON-508. Managerial Economics**Credit 3(3-0)**

This course will apply the tools and methods of microeconomic theory to specific management decision making in the private sector. Particular emphasis will be placed on pricing, profit, maximization, capital budgeting and financial decisions in the long-run.

ECON-510. Business Cycles**Credit 3(3-0)**

The general instability of capitalism and its causes, seasonal fluctuations and the secular trend. Business cycle history and theories. The influence of cycles on government fiscal policy.

ECON-512. Introduction to Econometrics**Credit 3(3-0)**

This course is intended to provide the student with a working knowledge of applications of modern statistical tools for the formulation and the verification or refutation of economic theories. Primary attention is given to quantitative estimates of parameters in single equation stochastic models. The course also introduces the student to simultaneous-equation models. Prerequisite: ECON 310 or consent of the instructor.

ECON-515. Comparative Economic Systems**Credit 3(3-0)**

A description and analytical study of the various systems that have developed in different countries at different times, motivations, production and distribution patterns.

ECON-520. Economic Development**Credit 3(3-0)**

This course surveys the problem of economic growth and development in modern times and analyzes the present efforts to increase the rate of economic growth. Selected case studies will be drawn from both highly developed nations and lesser developed nations. Special emphasis will be given to disproportioned growth in sectors of the United States economy.

ECON-525. Economics Seminar**Credit 3(3-0)**

The use of economic tools in delineating, analyzing and presenting economic problems that are not included in other courses. This course will include also an exposure to recent developments in economics.

ECON-599. Independent Study**Credit 3 or 6**

This course is designed for students involved in Cooperative Work-Study Program where the length and nature of their involvement warrants the awarding of such credit. The following conditions must be met in order to receive credit: (1) The credit will be determined by the department chairman at the time of registration; (2) the student must be registered at the University during the off-campus assignment; (3) the student should spend a minimum of three months in the off-campus experience for each three semester hours of academic credit. When the off-campus experience is in the form of seminar exposure, then not less than forty-five (45) clock hours should represent three semester hours of academic credit; (4) the student will be required to present a written report and/or other evaluation criterion that will be evaluated by the supervising teacher. Any special problem or technical report pursued by the student will be subject to prior approval by the department chairman or supervising teacher. Prerequisite: Consent of the advisor and/or department chair.

Advanced Undergraduate and Graduate**ECON-601. Economic Understanding****Credit 3(3-0)**

An introduction to the principles of economics utilizing the macro approach. No credit towards a degree in economics.

ECON-602. Manpower Problems and Prospects**Credit 3(3-0)**

An analysis of manpower development problems and prospects, with particular reference to the problems of unemployment, underemployment and discrimination. The course will focus on problem measurement, evaluation of existing policy and prospects for achievement of all human resource development. The course will invite an interdisciplinary participation on the part of students and faculty. Prerequisite: ECON 300 or 301; ECON 305 or equivalent, or consent of the instructor.

ECON-603. Manpower Planning**Credit 3(3-0)**

Manpower planning centers chiefly on the adjustment necessary to adapt labor resources to changing job requirements. This course is designed to prepare students to create plans which will facilitate this adjustment. This course will attempt to acquaint the student with labor force and labor market behavior such that the is able to make planning decisions relating to job creation (increasing demand) and education and training (increasing supply). Planning will be done at both the national (macro) and local (micro) levels, with special emphasis on the latter. We will further attempt to evaluate all planning decision by use of Cost-Benefit Analysis or Multivariate Analysis. Prerequisite: ECON 300 or 301; ECON 305 or equivalent, or consent of the instructor.

ECON-604. Economics Evaluation Methods**Credit 3(3-0)**

The course will cover needed tools of research design, statistical reporting, cost benefit analysis and other related techniques for internal and external evaluations of human resource development programs. The course is designed both for inservice personnel currently employed by agencies, and for the regular student enrolled in a degree-granting program.

ECON-610. Consumer Economics**Credit 3(3-0)**

This course is designed to acquaint the student with the nature, scope and tools of consumer economics. It is particularly oriented to minority groups, thus focusing on the economic choices currently affecting groups with rising incomes and aspirations. This course will consider the economic choices faced by the consumers in maximizing satisfaction with limited means.

**ECON-615. Economic, Political and Social Aspects of
the Black Experience****Credit 3(3-0)**

A study of the political, economic and social tools of current public policy treating the subject of race in America. This course will examine the economic and social conditions of income inequality and explore the national commitment to equal opportunity. Special emphasis will be placed on illustrations from North Carolina and adjacent states.

ECON-690. Special Topics in Economics**Credit 3(3-0)**

An examination of problems and analytical techniques in economics. The pursuit of certain specific or problem oriented area in economics not covered in other courses. Course content may vary from semester to semester. May not be repeated for credit.

Graduate**ECON-701. Labor and Industrial Relations****Credit 3(3-0)**

Two important sectors of the economy are examined - Labor and Management. Historical, public and governmental influences are studied.

ECON-705. Government Economic Problems**Credit 3(3-0)**

This course will consider the growth of public expenditures and revenues, and debt of the United States; theories of taxation and tax incidence; and the effects of public expenditures and taxes on economic growth.

ECON-710. Economic Development and Resource Use**Credit 3(3-0)**

This course deals with resource and economic development in the domestic economy and also a comparison drawn among development, developing and undeveloped societies.

ECON-720. Development of Economic Systems**Credit 3(3-0)**

An analytical approach to the study of various economic systems, how these systems developed and how they are organized to carry on economic activity.

Transportation**TRAN-360. Introduction to Transportation****Credit 3(3-0)**

Survey of the historic development and socio-economic impact of our nation's transportation system - and the interrelatedness of several modes (water, air, rail, motor and pipeline). Prerequisite: ECON 300; Corequisite: ECON 301.

TRAN-440. Physical Distribution**Credit 3(3-0)**

Analysis of alternative sources of transportation for moving raw materials into the production facility and finished goods into the channels of distribution. Illustrates integration of transportation decisions with those of production, inventory, warehousing and marketing management. Uses quantitative and non-quantitative concepts for plant and warehouse location decisions.

TRAN-450. Carrier Management**Credit 3(3-0)**

Introduction to the practical application of management practice and policies in the carrier sector of the Transportation industry.

TRAN-460. Traffic Management**Credit 3(3-0)**

Concepts and problems of freight traffic management, rate-making theories; rate and classification systems. Practical rate problems will be solved. Prerequisite: ECON 425 or consent of the instructor.

TRAN-570. Materials Management**Credit 3(3-0)**

Materials management will examine the integration of Logistics with other departments in a company. Within the context of the traditional functions of movement and storage on a systems approach it will focus on determination of material requirements, supplier selection, purchasing, pricing, warehousing, inventory control and scrap disposal.

TRAN-572. Procurement and Purchasing**Credit 3(3-0)**

This course deals with materials, component parts and supplies, and capital goods used in manufacturing operations. Emphasis is placed on procurement channels, vendor pricing strategies, leasing and buying options, purchasing research, and organizational structures affecting buyer-vendor relations.

TRAN-650. Transportation Law**Credit 3(3-0)**

A detailed review of the development of transportation law will be made. An analysis of the Interstate Commerce Act and its impact on surface carriers will be completed. This course will assist those students planning to take the bar exam for the Interstate Commerce Commission or those students studying for the Transportation Law exam in the American Society of Traffic and Transportation series. Prerequisite: BUAD 461 - Legal Environment of Business or equivalent is recommended.

TRAN-660. National Transportation Policy**Credit 3(3-0)**

A seminar on national transportation problems. This course will involve readings and research on several issues in transportation. Previous policy statements will be reviewed in light of current needs to determine what the current national transportation policy should be.

DIRECTORY OF FACULTY

Abdussalam Addus, B.A., Addis Ababa University; M.S., University of Wisconsin; Ph.D., Pennsylvania State University; Associate Professor

Nasir Assar, B.A., Iranian Banking College; M.B.A., Marshall University; M.A., Ph.D., West Virginia University; Assistant Professor

Julian Benjamin, B.S., New York University; M.S., Ph.D., State University of New York at Buffalo; Professor

David Chen, B.S., National Taiwan University; M.S., New Mexico State University; Ph.D., University of Wisconsin; Associate Professor

Basil Coley, B.S., A&T College; M.S., Pennsylvania State University; Ph.D., University of Illinois; Professor

Maury Granger, B.S. University of Louisville; M.A., Ph.D., University of Kentucky; Assistant Professor

Dong Jeong, B.A., Teachers College, Kyung-Pook National University, Korea; M.A., University of Hawaii; Ph.D., Wayne State University; Associate Professor

Anwar Khan, B.A., M.A., University of Punjab; M.A., Ph.D., University of Wisconsin; Professor

Vereda King, B.A., Johnson C. Smith University; M.B.A., North Carolina Central University; Ph.D., Duke University; Associate Professor

Lawrence Morse, B.A., Oberlin College; Ph.D., University of Minnesota; Associate Professor

Kofi Obeng, B.Sc., University of Science & Technology (Kumasi, Ghana); A.M., Ph.D., University of Pennsylvania; UPS Chair, Professor

Gregory Price, B.S., Morehouse; M.A., Ph.D., University of Wisconsin at Milwaukee; Assistant Professor

Ryoichi Sakano, B.S., Keio University; M.B.A., M.A., University of North Carolina at Greensboro; Ph.D., University of Alabama; Assistant Professor

Scott Simkins, B.A., St. John's University; Ph.D., University of Iowa; Assistant Professor

Michael Simmons, B.S., Arkansas AM&N; M.A., University of Wisconsin; Ph.D., Washington State University; Assistant Professor and Chairperson

Harry L. Sink, B.S., M.A., University of Tennessee; Ph.D. University of Tennessee; Assistant Professor

SCHOOL OF EDUCATION

David Boger, Dean
Larry Powers, Associate Dean

The School of Education prepares students for careers in elementary and secondary schools and for professional careers in industry, government and other agencies. The programs of study are planned to enable students to attain competence in both specialized and general areas of Education.

The School of Education includes the following departments: Curriculum and Instruction; Educational Leadership and Policy; Human Development and Services; and Health, Physical Education and Recreation.

All professional teacher education programs are administered and supervised by the School of Education. The Schools of Education and Graduate Studies cooperate with the supervision of graduate teacher education programs, especially as they relate to teacher certification. Moreover, the School of Education serves as the central agency for administering all teacher education programs.

The School of Education offers programs leading to the Bachelor of Science degree in Health and Physical Education, Recreation Administration, Elementary Education and Special Education (cross categorical).

In addition to the aforementioned programs, upon the satisfactory completion of an undergraduate program offered by other schools and departments in cooperation with the School of Education, the student is eligible to receive the Bachelor of Science in one of the following areas: Agricultural Education; Art Education; Biology Education; Business Education; Chemistry Education; English Education; French Education; History Education; Home Economics Education; Industrial Cooperative Training, Mathematics Education; Music Education; Physics Education; Social Studies Education; Speech Education; Theatre Arts Education; Technology Education; Trade Preparatory Programs; and School Social Work. General School Goals

1. To offer multicultural programs for students which promote the development of needed occupational and professional skills.
2. To provide opportunities for program enrichment for faculty, students and the community.
3. To continue to develop and improve ways and means for the improvement of all education programs and services, including student academic advisement.
4. To encourage continual faculty and student participation in curriculum reform in each academic department.
5. To continually maintain full accreditation of all programs on the state, regional, and national levels which are administered by the School of Education.
6. To continue to improve the quality of undergraduate instruction as measured by grade point averages and other measurable performance competencies.
7. To continue to encourage and promote faculty involvement and active participation in research and community affairs.
8. To continue the evaluation of program effectiveness in the School of Education.
9. To upgrade physical facilities and equipment needed in the School of Education to meet optimal operational levels.

THE TEACHER EDUCATION PROGRAM

The Teacher Education Program was accredited initially in 1976 by the National Council for the Accreditation of Teacher Education. This national accreditation was reaffirmed in 1991 until 1996.

The program of teacher education seeks to improve the quality of education available to the youth of North Carolina through improve preparation of teachers and other school personnel including administrators, guidance counselors and instructional supervisors. To that end, it offers both undergraduate and graduate programs of professional study which represent a continuum with sequential general goals. The program seeks, therefore, to realize these goals:

1. to prepare persons to take their places as competent members of the profession of education; and
2. to provide opportunities for students who wish to pursue graduate studies in education and advanced study for school personnel already established in education.

In order to carry out general goal "number one" of the Teacher Education Program as listed above, these objectives have been established:

1. Plan experiences for students in teacher education which will include the development of persons as individuals as well as specialists in a chosen academic area.
2. Plan multicultural learning environments conducive to appropriate stimulation for developing needed competencies in the following areas:
 - a. personal development
 - b. social development
 - c. professional development
 - d. citizenship maturity
3. Provide the highest level of instruction by way of well-qualified teaching and research personnel who can provide integrated experiences for teacher education students, which will make it possible for them to gain personal, social and academic competencies in the practice of the education profession.
4. Design an organizational structure to delineate and describe those competencies which will assure for teacher education students a quality experience specifically related to the vocational specialty that they will be expected to practice.
5. Plan all program development, evaluation, and supervision so that experiences gained are clearly oriented to the preservice dimension of the Teacher Education Program.

As the teacher education unit observes general goal "number two," the following objectives have been established:

1. Plan multicultural programs for graduate level students which will involve competencies already developed and which are being practiced, and infuse additional high level experiences that will give definite meaning to the competencies being sought. A sequential approach in curriculum development is observed.
2. Provide a learning environment which will stimulate in advanced students the desire to delineate and articulate those competencies in their respective specialties that will insure for them a high level of performance in the practice of their chosen vocation.
3. Emphasize those competencies which are necessary for all advanced students in education. Such competencies allow advanced students to have extensive and intensive experiences in research.

4. Plan and assess measurable competencies of advanced students which will permit these students to attain levels of leadership commensurate with graduate level expectations.

The Office of the University Registrar and the Dean of the School of Education are the central agencies vested with the authority and responsibility to recommend to the State Department of Public Instruction, students who are applying for licensure in the following fields:

1. Agriculture
2. Art
3. Biology
4. Chemistry
5. Comprehensive Social Studies
6. Elementary Education
7. English
8. French
9. History
10. Home Economics
11. Industrial Cooperative Training
12. Mathematics
13. Music
14. Physical Education
15. Physics
16. Pre-Vocational Education (Add-on)
17. Speech
18. Technology Education
19. Theatre Arts
20. Trade Preparatory Programs
21. Vocational Business Education
22. Vocational Business Education - Data Processing
23. School Social Worker
24. Special Education (Cross-Categorical)

In recognition of this function, the approval or endorsement of the department providing courses in the subject matter areas in which the candidate is to be licensed must be secured prior to the approval or endorsement of the Dean. The University reserves the right to refuse to recommend any applicants for certificates when they are deficient in mental or physical health, scholarship, character, or other qualifications deemed necessary for success in the profession of education.

The program in teacher education is divided into three separate but interrelated phases: (1) general education; (2) subject-matter specialization; and (3) professional education.

General Education

The general education phase of the Teacher Education Program functions to provide experience and learning which meet the fundamental needs of all teachers as persons, both in the role of teacher and citizen in a democracy. General education provides for the student the understanding, the knowledge, the appreciation, and the sensitivity attainable through the

study of a broad range of materials and concepts ranging across the humanities, the arts, the social sciences, the natural sciences and mathematics. It provides a broad understanding of the cultural heritage and of the physical and social environments. General Education is also an essential foundation for the teaching specialty and professional education.

All teacher education students are required to complete with an overall 2.50 average in the following courses or their equivalents in General Education:

English 100, 101, Ideas and their Expressions I, II

Mathematics 101, 102, Fundamentals of Algebra and Trigonometry I, II
or Mathematics III, College Algebra and Trigonometry

Speech 250, Speech Fundamentals

Biology 100, Biological Science or Chemistry 100, 110, Physical Sciences,
or other natural sciences

Psychology 320, General Psychology

History 100, 101, History of World Civilization I, II or History 204, 205,
United States History

Anthropology, Political Sciences, Economics or Geography

Humanities 200, 201, Survey of Humanities I, II or Humanities 203,
Humanities Perspectives of the South, English 210, Introduction
to Literary Studies

Physical Education 101 or 102, Fundamentals of Physical Education

Health Education 200, Personal Hygiene

Subject-Matter Specialization

Experiences of students in the subject-matter specialization area are designed to develop a high level of subject competence in those who later will seek certification in their respective specialties. Subject-matter specialization provides opportunities for the student to understand the theoretical basis upon which subject content is developed and organized. It also provides the student an opportunity to accumulate and to understand a vast body of facts which comprises one's selected discipline. The function of knowledge in the development of mature scholarship is emphasized in this segment of the prospective teacher's experiences also.

Professional Education

The professional education phase of the Teacher-Education Program is designed to induct the prospective teacher into the profession of education. During this segment of the student's experience he develops definable competence in the following:

1. Understanding the school as a social system with structures, functions, and special goals.
2. Understanding the learner (student) as a dynamic and unique personality capable of wide variation in behavioral adjustment.
3. Understanding the functional nature of human learning, how to diagnose and assess it, and how it takes place in individual and group settings, especially in organized school environments.
4. Understanding what resources facilitate learning and how these resources may be effectively used in a learning-teaching environment.
5. Understanding the processes at work between the school and the wider society which have influenced the learning-teaching situation, historically.

6. Understanding effective techniques and strategies for enhancing learning among students how have a wide range of needs, abilities, and interests.
7. Understanding the education profession as a medium through which continuous individual development of the teacher is paramount in order to maintain accountability to himself, to the students he will teach, to the profession proper, and to society in general.

Second Major Requirement

Effective fall 1989, freshmen students in selected teacher education majors are required to complete a second

concentration in a basic academic discipline as well as the necessary professional and major specialty courses. The second major requirement also applies to transfer students as follows:

-Students who transfer to senior institutions as freshmen or sophomores are subject to the academic concentration requirement beginning January 1, 1991.

-Students who enter the senior institutions as junior transfers in Fall 1992 or later are subject to the academic concentration requirement.

The planning of the academic program is under the guidance of the appropriate advisor.

The approved second majors are:

Biology	Mathematics
Chemistry	Psychology
Economics	Sociology
English	

Elementary education:

Art	Political Science
English	Psychology
History	Sociology
Mathematics	

Special education:

Art	History
Biology	Mathematics
English	

Business education-basic:

Chemistry	English
Economics	Mathematics

Business education-comprehensive:

Chemistry	English
Economics	Mathematics

Technology education:

Art	Mathematics
English	Political Science
French	Psychology
History	Sociology

Vocational-industrial education:

Art	Mathematics
English	Political Science
French	Psychology
History	Sociology

Health & Physical education:

Art	History
Biology	Mathematics
English	Psychology
French	Sociology

TEACHER EDUCATION ADMISSION AND RETENTION STANDARDS, INCLUDING LICENSURE PROCEDURES

Each current and prospective teacher education student will be informed, on an individual basis, of the probability that he or she might successfully complete the requirements for initial licensure as a teacher in North Carolina. This information will be part of the regular advising and counseling program of the university and will include a discussion of the SAT score, grade point average, and other predictive measures.

Admission

The Teacher Education Council makes all policies governing the entire Teacher Education Program; therefore, admission, retention and exit procedures are reviewed by the Council.

Formal admission to the Teacher Education Program is normally at the end of the sophomore year and the general studies requirements, although teaching majors are identified at admission to the University.

Students must meet each of the following criteria for formal admission to the Program.

1. Completed application approved by academic departments of certification areas
2. Minimum cumulative 2.50 GPA (on a 4.00) scale
3. Scores on file from the following standardized tests:

-Scholastic Aptitude Test

-16 Personality Factors Interest Inventory

-Reading Test

-Minimum Scores of 646 on* PRAXIS I

**See department chairperson for minimum scores on new NTE, PRAXIS*

4. Interview by Teacher Education Panel
5. Writing Sample approved by English Department faculty

Departments clear applicants on items 1-4 before applications are approved and submitted to the Office of the Dean, School of Education. The dean will notify the applicants in writing of admission or rejection.

Teacher Education Early Intent Plan

Effective 1993-1994, freshman students may begin the formal admission process during their first semester of matriculation.

The Early Intent Plan requires meeting each of the following criteria during the specified year:

Year I: Freshman Year

1. Achieve a satisfactory score on the Reading Test.
2. Earn a grade of "C" or better in required courses in English, mathematics, science and social sciences.
3. Complete the Freshman Year Program in the major as outlined.
4. Pass 32 semester hours of course work prior to the Sophomore year.
5. Complete speech assessment.
6. Join the Student National Education Association (SNEA).
7. Meet with advisor at least three times each semester.
8. Maintain a minimum cumulative grade point average of 2.5 on a 4.0 scale.

Year II: Sophomore Year

1. Maintain a minimum cumulative grade point average of 2.5 on a 4.0 scale.
2. Participate in SNEA.
3. Take the 16 Personality Factors Interest Inventory.
4. Pass the NTE PRAXIS I Tests.
5. Pass the Writing Sample Test.
6. Complete 75% of the General Studies Program.
7. Complete interview by Teacher Education Council Panel.
8. Complete formal application to Teacher Education.
9. Receive Teacher Education Formal Admission Letter.

Enrollment in Advanced Courses

ONLY FORMALLY ADMITTED STUDENTS MAY ENROLL IN advanced courses in the Professional Education Sequence. Undergraduate degree-seeking students are not permitted to complete more than one-half of the Professional Studies Sequence (excluding student-teaching) prior to being formally admitted to the Teacher Education Program.

The Professional Studies Sequence for secondary and special areas includes: CUIN 300, 301, 400, 436, 500, 525 or appropriate methods courses, 624, and 560. All courses numbered 500 and above in this sequence require formal admission to the Teacher Education Program or written permission of the chairperson and Dean for those persons seeking licensure only.

Transfer to the Teacher Education Program

Transfer policies refer to the students who start their college programs in an academic area (such as mathematics or chemistry) and decide to become teachers late in their college careers. The following requirements are necessary for admittance to the Teacher Education Program under these conditions:

1. The student must have satisfied the general education requirements.
2. The student must have a minimum cumulative 2.50 grade point average.
3. The student must apply formally to be admitted to the Teacher Education Program. Application will be made to the Chairperson of the Department in which the student plans to major.
4. The student must meet the same criteria recommended for other students.

5. The Chairperson of the Academic Department has the responsibility of enrolling the student in the Teacher Education Program after the student has met all requirements.

Transfer students interested in applying must meet the same initial requirements for entry.

Retention

To remain in the Teacher Education Program, students must maintain a minimum academic average of 2.50 in their subject area and in professional education. Students must meet with their advisor a minimum of twice per term to discuss progress in the program. If students fail to maintain academic requirements or for other reasons, they will be notified of their probationary status or dropped from the program by their respective academic departments, deans, and the Director of Teacher Education.

Readmission to Teacher Education Program

Once a student has been dropped from the Teacher Education Program for any reason, the following steps must be taken before a student will be readmitted to the Teacher Education Program:

1. The students must file a formal application for readmittance to the Teacher Education Program
2. The application of the student along with the student's complete profile must be brought before the Teacher Education Council for action.
3. The student, Department Chairperson, Dean of the School involved and the Chief Officer of Academic Affairs will be formally notified in writing of the action of the Teacher Education Council with reference to the student's application for readmission to the Teacher Education Program.

Student Teaching

Admission to Student Teaching requires (1) formal admission to the Teacher Education Program, (2) an approved student teaching application form signed by the student's advisor and department chairperson, and (3) personnel data sheets which are needed for placement.

Procedures for Graduate Who Completed A Non-Teacher Education Program

The following procedure leading to institutional recommendation for licensure is to be followed by one who graduated from an accredited college with a minimum cumulative grade point average of 2.5 (on a 4.0 scale). The candidate did not complete a program leading to teacher certification or plans to convert to a new license area:

1. The official copy(ies) of the candidate's transcript and other appropriate credentials must be filed with the academic department of the area in which the candidate is seeking certification.
2. The candidate's credentials must be evaluated by the academic department of the certification area. Four copies of the department's evaluation must be prepared and transmitted as follows:
 - one copy to the candidate
 - one copy to the Director of Teacher Education
 - one copy to the Dean of the School/College in which the academic department is located
 - one copy for the academic department
3. Original copies of the candidate's credentials must be filed after evaluation by the academic department with the Office of Teacher Education.

4. The student must have a minimum cumulative grade point average of 2.5 (on a 4.0 scale) in his bachelor's degree program. The candidate must satisfy the institutional assessment and meet the requirements of the evaluation.
5. The candidate seeking initial licensure in a teaching field must apply for admission to the Teacher Education Program. The PRAXIS Test may be required, if warranted. The requirement must be recommended by the Chairperson of the department of the candidate's license area. GRE requirements may be used by students of graduate standing.
6. The candidate must complete a minimum of 12 semester hours at A&T State University before the University recommends the candidate for a license.
7. The candidate must have at least three advisement conferences with his/her faculty advisor during the program to include the point of admission and point of completion. These conferences must be documented consistent with SDPI Form IHE-01a.
8. When the program is completed, the candidate will initiate his application for certification in the Office of Teacher Education. The Office of Teacher Education responsible for the campus processing of the certification application.

LICENSURE

After completing the Teacher Education Program, the student must apply for state licensure in the School of Education Dean's Office which will send the completed application form to the Office of Registration and Records. This office will attach a copy of the student's official transcript to the application form and forward it to the State Department of Public Instruction in Raleigh, North Carolina.

The student is required to take the National Teacher Examinations. The student must score at a level that is satisfactory to the State Board of Education.

Passing scores on the appropriate PRAXIS Tests. (See your advisor, program coordinator, or department chairperson.)

Department of Curriculum and Instruction

Pamela Hunter, Chairperson

OBJECTIVES

The Department of Curriculum and Instruction provides the professional studies component for the preparation of effective teachers and school personnel at the bachelor's degree and master's degree levels. The department cooperates with the various academic departments of the University for teacher education preparation. In addition, the department offers graduate programs in the areas of elementary education, reading, and educational media.

DEGREES OFFERED

Elementary Education - Bachelor of Science

**Elementary Education - Master of Science

**Reading Education - Master of Science

**Educational Media - Master of Science

***See the Bulletin of the Graduate School*

PROFESSIONAL STUDIES COMPONENT

The professional studies component of the Teacher Education Programs is designed to provide for the development of those competencies essential to the professional role of a teacher or special service professional.

Undergraduate. Approximately eighteen percent of the undergraduate curriculum constitutes the professional studies component. Specific teacher competencies are developed through the provision of:

1. A study of the processes and theories of human growth development, learning and teaching with field experiences.
2. A humanistic study of the problems, issues and trends in education within a historical, philosophical, sociological, economic and governmental framework.
3. Instruction and experiences in creating and using learning environments.
4. A study of the process and techniques for analyzing and evaluating the teaching learning environment.
5. Experiences for the acquisition of knowledge, attitudes, and skills for positive human and social relationship.

Graduate. At the master's degree level, approximately 20 to 40 percent of the graduate program is comprised of professional studies. Candidates for degrees in Elementary Education K-6 must complete a minimum of 12 semester hours and candidates in secondary education must complete a minimum of six semester hours in professional studies. Specific professional studies courses are listed in the *Graduate School Bulletin*.

ELEMENTARY EDUCATION OBJECTIVES

The objectives of the undergraduate elementary education program are: to provide a course of study to prepare students for teaching and teaching-related careers; to offer a course of study which promotes the development of general and professional knowledge that serves as a foundation for appropriate educational practices; and to provide opportunities which develop knowledge and understanding of the curriculum.

The emphasis of the program is on the application of learning theory, teaching strategies, and instructional materials to practice. The program provides opportunities for prospective teachers to: plan, organize, and implement developmentally appropriate instructional experiences. Experiences which expedite development and learning in the following areas are emphasized: cognitive, language, physical, social and aesthetic. Also, the program provides for sequentially planned field experiences which enables potential teachers to apply knowledge and skill to actual situations.

At the graduate level, the program provides for flexibility within a prescribed framework. Students are able to extend and broaden their knowledge of the purpose and role of education. The nature of the learner; the learning process; the ability to work effectively which the content and instructional areas are stressed here. Students gain insight and skill in the use of research techniques and designing projects.

DEPARTMENTAL REQUIREMENTS

Students majoring in elementary education at the undergraduate level must complete 128 semester hours consistent with the curriculum guide. The curriculum guide includes second major/elective hours in a basic academic discipline. Students must meet the requirements for admission to teacher education. Individuals should refer to the section entitled *Teacher Edu-*

cation Admission and Retention Standards (*Undergraduate Bulletin*) for pertinent information relative to requirements as a teacher education candidate. Additionally, in the program of study (curriculum guide) are professional studies courses and major/specialty area courses. Individuals must attain a minimum grade of "C" in these courses.

Initial Licensure Requirements

Undergraduate Students—The student is required to take the NTE Professional Knowledge (Core Battery III) and the Specialty Area tests. Students must attain the minimum scores on these respective tests as established by the state Board of Education.

Graduate Students—Individuals who have graduated from an accredited college/university and did not pursue a program of study or complete requirements leading to teacher certification should file application for admission to the School of Graduate Studies. Refer to the section, *Procedures for Graduates Who Completed A Non-Teacher Education* (undergraduate) Program for explicit instructions.

CAREER OPPORTUNITIES

In addition to preparing teachers certification for K-6, a degree in this field also provides for career opportunities in allied fields such as health, social service, child/family relations, communication arts and other diversified areas.

CURRICULUM GUIDE FOR ELEMENTARY EDUCATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
PHED 200	2	CUIN 202	1
PHED 101	1	BIOL 100	4
HIST 204/205	3	HIST 200/210 or EASC 201	3
POLI 200/210	3	SECOND MAJOR (elective)	3
	<u>15</u>		<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
CHEM 100	3	PSYC 320	3
CHEM 110	1	CUIN 301	2
HOEC 311	3	HDSV 350	3
CUIN 300	2	PHED 229	1
SPCH 250	3	SECOND MAJOR (elective)	3
SECOND MAJOR (elective)	3	SECOND MAJOR (elective)	3
	<u>18</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 400	3	CUIN 436	3
PHED 462	3	PHED 442	2
ENGL 626	3	CUIN 511	3
ART 600	3	CUIN 415	2
MUSI 610	3	THEA 620	3
SECOND MAJOR (elective)	<u>3</u>	CUIN 611	<u>3</u>
	18		16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 629	3	CUIN 559	9
CUIN 510	2	CUIN 562	<u>3</u>
CUIN 512	2		12
CUIN 513	2		
CUIN 514	2		
SECOND MAJOR (elective)	<u>3</u>		
	14		

Total Credit Hours: 128

PROFESSIONAL STUDIES COMPONENT FOR SECONDARY AND SPECIAL AREAS

Sophomore Year

<i>Fall Semester</i>	<i>Credit</i>	<i>Spring Semester</i>	<i>Credit</i>
311 300	2	311 301	<u>2</u>
*PSYC 320	<u>3</u>		2
	5		

Junior Year

<i>Fall Semester</i>	<i>Credit</i>	<i>Spring Semester</i>	<i>Credit</i>
311 400	<u>3</u>	311 436	<u>3</u>
	3		3

Senior Year

<i>Spring Semester</i>	<i>Credit</i>
311 500	3
311 525 or appropriate methods course	3
311 560	0
311 624	6
	<u>3</u>
	15

**Prerequisite to 311; 400, not a professional education course.*

COURSES WITH DESCRIPTION IN CURRICULUM AND INSTRUCTION

Undergraduate

- CUIN-202. Field Experience Orientation** **Credit 1(1-1)**
Off-campus field experience in which the student becomes acquainted with the school environment, the teachers role, pupil (learner) characteristics, and appropriate teaching/learning experiences. Scheduled seminars to complement the structured observation/minimal participation experiences.
- CUIN-300. Introduction to Education** **Credit 2(2-0)**
An overview of the historical background of the systems of education in the United States, their aims, organization and procedures, and of the principles and practices on all levels of the American educational system; emphasis on North Carolina. Classroom observation/participation experiences.
- CUIN-301. Philosophical and Sociological Foundations of Education** **Credit 2(2-0)**
A view of the educative process and its philosophical foundations; emphasis on the philosophical implications of education as they relate to student curriculum, teacher, and the institution. Classroom observation/participation experiences.
- CUIN-302. Field Experiences and Community Services** **Credit 1-3**
Field experiences as tutor, assistant, participant or employee in a school or education related institution, organization, agency, community, church, business or industrial program involving interaction with children, youth or adults. Evaluation and written reports required. Planned in consultation with an instructor.
- CUIN-303. Socio-Philosophical Aspects of Education** **Credit 4(4-0)**
An examination of past and contemporary factors in American Education through philosophical and sociological perspectives. Exploration of problems and possibilities inherent in relating theory and practice in education.
- CUIN-315. Family, Community, and School**
(Formerly Elementary Education and Reading 315) **Credit 3(3-0)**
Study of the relationships of the family, community, and school that involve the learner, with emphasis on the young child. Attention to family structure, parent education and involvement with the school and community, community development and participation in education. Consideration of research and identification of current problems and issues. Projects relating to the local community.
- CUIN-343. Methods and Materials of Bibliography** **Credit 2(2-0)**
An examination and valuation of the principles and methods of bibliographic planning with emphasis on library skills and research techniques.
- CUIN-400. Psychological Foundations of Education - Growth and Development** **Credit 3(2-2)**
Restricted to Teacher Education Students. Psychological principles governing the interests and needs of pre-adolescence and adolescence; emphasis is placed on general principles of growth and development; physical, motor, intellectual, social, emotional and moral aspects. Observing, recording and interpreting human behavior including functional conceptions of learning will be provided in laboratory settings. Prerequisites: Psychology 320, Curriculum and Instruction 300, 301.
- CUIN-402. Extramural Studies I** **Credit 1-3**
Off-campus experiences, testing or exploring relevance of education to real world situations in an agency, organization, institution or business. Project report and evaluation by permission of department.

CUIN-413. Learning and Practice **Credit 3(3-0)**

Survey and analysis of learning theories and the learning process with applications to education. Integration of theoretical viewpoints and research findings with observations and experience in classroom situations. Prerequisite: Psychology 320.

***CUIN-415. Curriculum Design and Instructional Planning in the Elementary School** **Credit 2(2-0)**

Emphasis on planning a developmentally appropriate and integrated classroom program which reflects proven educational practices and research. The course includes exposure to various sources of curriculum relative to content, organization and instruction.

CUIN-436. Tests and Measurements **Credit 3(2-2)**

A basic study of standardized and teacher-made measuring devices, acceptable methods of selecting, administering, and interpreting all types of tests applicable to the school and classroom.

***CUIN-451. Foundations of Early Childhood Education**
(Formerly Elementary Education and Reading 451) **Credit 2(2-0)**

The study of the historical background and the sociological, philosophical, economic factors, and current issues relating to early childhood education; the physical plant, equipment, supplies and other facilities necessary for appropriate experiences.

All courses numbered 500 and above require formal admission to the Teacher Education Program or written permission of the Department Chairperson and Dean for those persons seeking certification only.

***CUIN-500. Principles and Curricula of Secondary Schools** **Credit 3(3-0)**

The history, nature, and function of the secondary school and its relationship to the elementary school and adult life. Prerequisite: 12 semester hours in education and psychology.

CUIN-501. Methods of Research and Evaluation in Health Physical Education **Credit 2(1-2)**

The use of various research methods as applied to health education and physical education and the study of methods of evaluating biological, social, and physiological outcomes for health education and physical education. Elementary statistical procedures are utilized. Prerequisites: Curriculum and Instruction 436.

***CUIN-510. Teaching Language Arts in the Elementary School** **Credit 2(2-0)**

Methods, content, resources and materials for teaching the language arts in grades K-6. Emphasis on the interrelatedness of listening, speaking, viewing, reading and writing. Classroom observation/participation experiences in an elementary school.

***CUIN-511. Teaching Reading in the Elementary School** **Credit 3(3-0)**

Basic course in methods, materials and techniques used in reading instruction for grades K-6. Attention to the acquisition, development and extension of language. Emphasis on developmentally appropriate instructional practices. Classroom observation/participation experiences in an elementary school.

***CUIN-512. Social Studies in the Elementary School** **Credit 2(2-0)**

The instructional program in social studies for grades K-6. Emphasis on current methods, content, resources and materials. Classroom observation/participation experiences in an elementary school.

***CUIN-513. Strategies for Teaching Science in the Elementary School** **Credit 2(2-0)**

Stresses an integrated, discovery-centered program with developmentally appropriate experiences for children in grades K-6. Emphasis on science curriculum materials and teaching strategies to achieve instructional objectives. Classroom observation/participation experiences in an elementary school.

- *CUIN-514. Strategies for Teaching Mathematics in the Elementary School** **Credit 2(2-0)**
Stresses the need for elementary school (K-6) children to learn mathematics content through the use of concrete materials (manipulatives) and hands-on experiences. Emphasis on developing an understanding of concepts and skills through discovery, observation and diagnostic procedures. Classroom observation/participation experiences in an elementary school.
- *CUIN-519. Preschool Materials, Methods and Practicum** **Credit 3(2-2)**
(Formerly Elementary Education and Reading 519)
Methods, materials and program planning for the preschool child. Directed observation and participation in an established pre-school program such as a day care center, nursery or kindergarten.
- *CUIN-525. Methods of Teaching Art** **Credit 3(3-0)**
A study of aims, objectives, methods and techniques of art teaching in the modern schools. Special attention given to planning courses of material and correlation. Required of those wishing to qualify as art teachers. Prerequisites: 30 hours of Art and 15 hours of Education and Psychology.
- *CUIN-526. Methods of Teaching English** **Credit 3(3-0)**
A study of materials and methods of teaching English in the high school. Required of those planning to teach English. Prerequisites: English 450, 430; 24 additional hours of English courses above English 100 and 15 semester hours in Education and Psychology.
- *CUIN-527. Methods of Teaching Foreign Languages** **Credit 3(3-0)**
A study of the problems and strategies in teaching foreign languages. Special attention given to the matter of classroom aids, equipment, etc. Required of those students planning to teach the subject. Prerequisites: 27 hours of French and 15 semester hours of Education and Psychology.
- *CUIN-528. Methods of Teaching Home Economics** **Credit 3(3-0)**
A study of the objectives, methods, and techniques necessary for teaching vocational home economics on the secondary level.
- *CUIN-529. Methods of Teaching Mathematics** **Credit 3(3-0)**
An evaluation of subject matter, materials, methods, and techniques and objectives in the teaching of mathematics in the junior and senior high school. Required of those planning to teach the subject. Prerequisites: 30 hours of mathematics and 15 hours of Education and Psychology.
- *CUIN-530. Public School Music Methods** **Credit 2(2-0)**
A comprehensive study of materials and methods in the teaching of public school music.
- *CUIN-531. Vocal Methods and Materials** **Credit 3(3-0)**
The teaching of vocal music in the public schools; vocal literature for vocal combinations in the public schools.
- *CUIN-532. Band Methods** **Credit 3(3-0)**
A study of school band organization and administration. Offered Fall semester.
- *CUIN-533. The Teaching of Physical Education** **Credit 3(3-0)**
This course is a study of the teaching/learning process in health and physical education within the middle and secondary school. It emphasizes the planning, implementing, and evaluating of health and physical education activities within the school setting. Prerequisites: Admission to Teacher Education, and approval of the HPER Chairperson.

***CUIN-534. The Teaching of Health Education**

Credit 2(2-0)

Methods, materials and procedures for the teaching of health in the elementary and secondary schools. Field experiences will include: observation, and service as aides and assistants. Prerequisites: Health Education 220, 440, and 442; Zoology 469 and 560.

***CUIN-535. Methods of Teaching of Science**

Credit 4(3-1)

A study of methods, materials and techniques of teaching Biology, Chemistry, Physics, General Science, and Environmental Science in the high school. Required of all those planning to teach in this field. Prerequisites: 27 hours of Science and 15 semester hours of Education and Psychology.

***CUIN-536. Methods of Teaching Social Sciences**

Credit 3(3-0)

A study of techniques of social science instruction on the high school level. Required of those planning to teach the subject. Prerequisites: 27 hours of Social Studies and 15 semester hours of Education and Psychology.

***CUIN-539. Methods of Teaching Speech and Theatre**

Credit 3(3-0)

A study of the aims, objectives, problems and difficulties experiences in teaching speech in the modern school. Special attention is given to the organization and coordination of both speech and theatre curriculums, to planning courses of study, its presentation, and to the selection of materials and equipment required of all Speech and Theatre Education majors. Prerequisites: 27 hours of Speech and 15 hours of Education and Psychology.

**CUIN-556. Curriculum and Methods in Literature, Language Arts, and Social Studies in Early Childhood Education
(Formerly Elementary Education and Reading 556)**

Credit 3(2-2)

The study of basic principles underlying the social studies and language arts curriculum; children's literature, appropriate materials and methods for kindergarten-primary grades. Development of concepts and skills relating to the scope and importance of social studies and language arts in the total program. Laboratory and observations experiences.

CUIN-557. Curriculum and Methods in Science and Mathematics in Early Childhood Education

Credit 3(2-2)

Basic principles underlying the science and mathematics curriculum. Consideration of appropriate materials and methods for kindergarten through primary grades. Development of concepts and skills relating to the scope and importance of science and mathematics in the schools programs. Simulated teaching experiences.

**CUIN-558. Student Teaching and Seminar in Early Childhood Education
(Formerly Elementary Education and Reading 558)**

Credit 6(2-8)

Observation and guided teaching experiences in the kindergarten through grade three to include 90 or more clock hours of actual teaching. The application and practice of methods, techniques, and materials of instruction in a real classroom situation under supervision, includes purposeful observation, organization of teaching materials, participation in other activities.

***CUIN-559. Observation and Student Teaching in the Elementary School**

Credit 9(1-16)

Observation and supervised teaching experiences in the elementary grades (K-6). Application and practice of methods, techniques and materials of instruction in a real classroom situation under supervision. To be taken concurrently with CUIN 562. Seminar in Elementary Education.

***CUIN-560. Observation and Student Teaching**

Credit 6(2-8)

The application and practice of methods, techniques, and materials on instruction in a real classroom situation under supervision, includes purposeful observation; organization of teaching

materials; participation in other activities which will aid in developing a teacher (Guidance activities, child accounting, cocurricular activities, parent-teacher associations, teachers's meetings), and ninety or more clock hours of actual teaching. Prerequisites: Overall GPA of 2.50 in both the professional and major components and approval of major department.

***CUIN-561. Seminar**

Credit 1(1-0)

A consideration of selected topics and current trends in the field of education.

***CUIN-562. Seminar in Elementary Education**

Credit 3(1-0)

A consideration of selected topics and current trends in the field of elementary education. Topics differ in response to current interests, issues and research findings. Students will participate in group sessions during the student teaching experience. The sessions may be conducted at a selected school or on campus. To be taken concurrently with student teaching.

DIRECTORY OF FACULTY

David Boger, B.S., Livingston College; M.S., New Mexico Highlands University; Ph.D., University of New Mexico, Dean of School of Education and Professor

Gloria Edwards, B.A., Rutgers State University; M.A., Montclair State College; Assistant Professor

Karen D. Guy, B.S., N.C. A&T State University; M.Ed., N.C. Central University; Ed.D., University of North Dakota; Assistant Professor and Acting Director of Student Teaching and Educational Internships

Pamela I. Hunter, B.A., Livingstone College; M.Ed., University of North Carolina at Greensboro; Ph.D., The Ohio State University; Associate Professor and Chairperson

Gary G. Mims, A.B., Belmont Abbey College; M.A., Appalachian State University; Ed.S., Appalachian State University; Ph.D., Georgia State University; J. D., Woodrow Wilson College; Assistant Professor

Amy Reynolds, B.S., Dillard University; M.Ed., Mercer University; Ed.D., University of North Carolina at Greensboro; Associate Professor

Barbara L. Saunders, B.S., Central State University; M.S., Indiana State University, Ph.D., The Ohio State University; Associate Professor

Thomas Smith, B.S., Manchester College; M.S., Indiana University; Ph.D., University of South Carolina; Assistant Professor

Dawn Waegerle, B.A., M.A., Oral Roberts University; Ed.D., College of William and Mary; Assistant Professor

Genevieve L. Williams, B.A., Bennett College; M.S. N.C. A&T State University; M.S., University of Georgia Athens; Ph.D., The Ohio State University; Assistant Professor

Department of Educational Leadership and Policy

Fred S. Wood, Jr.
Interim Chairperson

OBJECTIVES

The Department of Educational Leadership and Policy offers graduate level programs of preparation in Administration, Adult Education and Supervision. The Master's degree programs in Administration and Supervision are teacher education programs which meet the state adopted competency-based guidelines. These programs of study lead to North Carolina Certification at the Administrator I and Curriculum Instructional-Specialist I levels. The

Master of Science in the Adult Education program is not considered as a teacher education program but it is developed and implemented on competency-based guidelines. The Department also offers programs of certification in Administration and Supervision for those students who already hold a Master's degree in education with certification in other professional areas.

The graduate programs in the department are designed to prepare students for positions in public school administration; adult education, supervision of instruction and administration primarily at the Community College/Technical Institute levels. Program requirements and curricula are described in the Bulletin of The Graduate School.

DEGREES OFFERED

Educational Administration and Supervision - Master of Science*

Educational Administration and Supervision (Concentration in) - Master of Science

Adult Education - Master of Science

** No new students will be admitted to this program after November, 1994.*

DIRECTORY OF FACULTY

Marion R. Blair, B.S., A&T State College; M.A., Seton Hall University; Ed. D., Indiana University; Professor

Bernadine S. Chapman, B.S., M.A., Columbia University; Ed. D, Northern Illinois University; Assistant Professor

Edward B. Fort, B.S., M.S., LL. D., Wayne State University; Ed. D., University of California, Berkeley; Professor and Chancellor

Raymond L. Lows, B.S., Georgetown (Kentucky) College; M.S., Southern Illinois University; Ph.D., Illinois State University; Professor

Larry Powers, B.S., M. Ed., Tuskegee University; Ph.D., Michigan State University; Associate Dean and Associate Professor

Fred S. Wood, Jr., B.S., M.S., M.S., North Carolina A&T State University; Ed. D., University of North Carolina; Assistant Professor and Interim Chairperson

Department of Human Development and Services

Wyatt D. Kirk, Chairperson

OBJECTIVE

The Department of Human Development and Services offers the undergraduate level program of preparation in Special Education Cross-Categorical. It is designed to develop professional competencies and understandings needed to teach children with special needs in grades P-12. The program is interdisciplinary and requires a minimum of 128 semester credit hours. A second major is required as of 1989. Students majoring in Special Education should consult with an advisor as to an appropriate second major. Satisfactory completion of the program leads to the Bachelor of Science Degree in Special Education and to North Carolina teacher certification in grades P-12. Program requirements and curricula can also be found in the Undergraduate Bulletin.

The Department offers master's degree programs in counseling, which are outlined in the *Bulletin* of the Graduate School.

DEGREES OFFERED

Special Education - Bachelor of Science

Counselor Education - Master of Science

Human Resource - Master of Science with concentrations in:

A. Agency Counseling

B. Business and Industry

PROGRAM REQUIREMENTS

The Special Education Cross-Categorical Program is designed to develop professional competencies and understandings needed to teach mildly handicapped students who are behaviorally disordered, learning disabled, and mentally retarded. The program is interdisciplinary and requires a minimum of 128 semester credit hours. Satisfactory completion of the curriculum leads to the Bachelor of Science degree in Special Education and to North Carolina Teacher Certification in grades K-12.

Student must meet the requirements for admission, retention, and exit from the University's Teacher Education Program. Students majoring in Special Education will also have to take a second area of concentration consisting of approximately 24 hours (See advisor for second area alternatives).

CURRICULUM GUIDE FOR SPECIAL EDUCATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 100	4	CHEM 100	3
ENGL 100	3	ENGL 101	3
MATH 101	3	MATH 102	3
HIST 204	3	HIST 205	3
PSYC 242	3	SPCH 250	3
	<u>16</u>	PHED 101	<u>15</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
CUIN 300	2	CUIN 301	2
HDSV 350	3	PSYC 324	3
HDSV 351	3	HDSV 352	3
SMC	3	HDSV 435	3
Electives	3	SMC	3
	<u>17</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 415	2	HDSV 541	3
CUIN 511	3	HDSV 566	3
CUIN 514	2	HDSV 542	3
HDSV 536	3	SMC	6
HDSV 539	3	Electives	3
Electives	3		18
	<hr/> 16		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HDSV 664	3	HDSV 545	3
SMC	12	HDSV 546	3
Elective	1	CUIN 560	6
	<hr/> 16		<hr/> 12

Total Credit Hours: 127

SMC (24 Credits) ART, BIOLOGY, ENGLISH, HISTORY, or MATH

COURSES WITH DESCRIPTION IN HUMAN DEVELOPMENT AND SERVICES

Special Education Curriculum

HDSV-350. Introduction to Exception Children Credit 3(3-1)

An overview of the educational needs of exceptional or "different" children in the regular classroom situation; emphasis placed on classroom techniques known to be most helpful to children having hearing losses, speech disorders, visual problems, emotional, social handicaps and intelligence deviation, including slow-learners and gifted children. An introduction to the area of special education. Designed for classroom teachers. An observation/practicum will be required.

HDSV-351. Introduction to Learning Disabilities Credit 3(3-1)

The identification and education of children and youth with learning disabilities, including teaching strategies, theories, programs and materials. Field experience.

HDSV-352. Introduction to Emotional Disturbance* Credit 3(3-1)

An introductory course in the education of the emotionally handicapped child. Psychological, sociological, and educational implications will be emphasized. Various theoretical views and approaches will be explored. (Field Experience)

HDSV-451. Speech and Language Stimulation for Exceptional Children Credit 3(3-0)

The study of normal speech and language development and the disorders of speech and language. Specific competencies would be developed in the habilitation of speech and language disorders frequently associated with the categorical areas.

HDSV-536. Educational Assessment and Curriculum Development for the Exceptional Infant and Young Child* Credit 3(3-0)

Evaluation, methods and materials used with the very young and preschool child with mild and moderate handicapping conditions. This course must be taken concurrently with Educational Assessment and Curriculum Development for the Primary and Intermediate Exceptional

Child, Educational Assessment and Curriculum Development for the Secondary Exceptional Person and Seminar in Educational Assessment and Curriculum Development. Field experience.

**HDSV-537. Educational Assessment and Curriculum Development
for the Primary and Intermediate Exceptional Child Credit 3(3-0)**

Evaluation, methods and materials used with the primary and intermediate exceptional child with mild and moderate handicapping conditions. This course must be taken concurrently with Educational Assessment and Curriculum Development.

**HDSV-538. Educational Assessment and Curriculum Development
for the Secondary and Adult Exceptional Person* Credit 3(3-0)**

Evaluation, methods and materials used with the secondary and adult exceptional person. This course must be taken concurrently with Educational Assessment and Curriculum Development for the Exceptional Infant and Preschool Child, Educational Assessment Curriculum Development for the Primary and Intermediate Exceptional Child and Seminar in Educational Assessment and Curriculum Development.

HDSV-539. Behavior Management of Exceptional Children and Youth Credit 3(3-0)

A survey of relevant research and techniques that are applicable for behavior management in a learning situation for exceptional children and youth.

**HDSV-540. Seminar in Educational Assessment and
Curriculum Development Credit 3(3-0)**

Field experiences designed to provide practice in assessment, methods and materials with the exceptional student. This course must be taken concurrently with Educational Assessment and Curriculum Development for the Exceptional Infant and Preschool Child, Educational Assessment and Curriculum Development for the Primary and Intermediate Exceptional Child, and Educational Assessment and Curriculum Development for Secondary Exceptional Person.

**HDSV-541. Teacher-Parent-Community Resources for
Exceptional Children Credit 3(3-0)**

A survey of the psychological and sociological factors affecting exceptional children and their families as well as techniques used in working and communicating with families of exceptional children and community resources.

HDSV-542. Diagnostic Prescriptive Teaching* Credit 3(3-0)

The study of the diagnostic prescriptive model of Special Education with emphasis on writing individualized programs for exceptional children utilizing curricular variables.

HDSV-543. Practicum in Special Education Credit 3(3-1)

Observation, participation, and teaching in an educational program for special needs children. (Field Experience)

HDSV-544. Student Teaching Credit 6(2-4)

The application and practice of methods, techniques, and materials of instruction in a real classroom situation under supervision, includes purposeful observation; organization of teaching materials, participation in other activities which will aid in developing a teacher (guidance activities, child-accounting, cocurricular activities, parent-teacher associations, teachers' meetings), and ninety or more clock hours of actual teaching. Prerequisites: Overall GPA 2.00 in both the professional and major components and approval of major department.

HDSV-545. Special Education Seminar Credit 3(3-0)

This course is integrative in nature offering the student an opportunity to synthesize concepts, theories and methods learned. Students will be encouraged to explore through research in depth special topics relating to exceptional children and youth.

- HDSV-546. Occupational Orientation and Training for the Exceptional Youth** **Credit 3(3-1)**
 Background development of job training programs, covering aspects of occupational adjustments in terms of practical academic experiences and employment opportunities. (Field Experience)
- HDSV-662. Mental Deficiency** **Credit 3(3-0)**
 A survey of types and characteristics of mental deficiencies; classification and diagnosis criteria for institutional placement and social control of mental deficiency.
- HDSV-566. Introduction to Mental Retardation** **Credit 3(3-0)**
 A study of the degrees, types, diagnoses, and classification of mental retardation, including historical development, curriculum, and theoretical strategies. Field experience.
- HDSV-660. Introduction to Exceptional Children** **Credit 3(3-0)**
 A survey of children and youth with special focusing on historical and current treatment. Emphasis will be on psychological, sociological, physiological, and educational needs of special needs children. Field experience.
- HDSV-661. Psychology of the Exceptional Child** **Credit 3(3-0)**
 An analysis of psychological factors affecting identification and development of mental retarded children, physically handicapped children, emotionally and socially maladjusted children, and other children with special needs.
- HDSV-663. Measurement and Evaluation in Special Education** **Credit 3(3-0)**
 The selection, administration, and interpretation of individual tests; intensive study of problems in testing exceptional and extremely deviant children; consideration to measurement and evaluation of children who are mentally, physically, and emotionally or socially handicapped. Emphasis upon the selection and use of group tests of intelligence and the interpretation of their results. Field experience.
- HDSV-664. Materials, Methods, and Problems in Teaching the Special Needs Child** **Credit 3(3-0)**
 Basic organization of programs for the education of the mentally retarded; classification and testing of mental deficiencies, curriculum development and principles of teaching intellectually slow children. Attention is also given to the provision of opportunities for observing an working with children who have been classified as mentally retarded, emotionally disturbed and learning disabled. Techniques for teaching these individual will be explored.
- HDSV-667. Specific Learning Disabilities** **Credit 3(3-0)**
 This course will address specific learning problems associated with reading writing, language, cognition, perception attention, arithmetic, social and emotional disabilities.
- HDSV-668. Children & Youth with Behavioral Disorder** **Credit 3(3-0)**
 A study of issues, definitions, classification, characteristics causes and prevalence of children and youth with behavioral disorders. It will examine models, assessments, and intervention strategies.

DIRECTORY OF FACULTY

Patricia D. Bethea, B.S., North Carolina Central; M.Ed., University of North Carolina-Chapel Hill; Ed.D., University of North Carolina at Greensboro, Assistant Professor

Cathy Kea, B.A., North Carolina A&T State University; M.S., University of Wisconsin-LaCross; Ph.D., University of Kansas; Assistant Professor

Wyatt D. Kirk, B.S., M.S., Ed.D., Western Michigan University; Associate Professor and Chairperson

Aurelia C. Mazyck, B.S., Howard University; M.S., New York University; Ph.D., The University of North Carolina at Greensboro; Associate Professor

Morris C. Peterkin, B.S., Cheyney State College; M.S., Governors State University; M.Ed. Certificate, Temple University; Ph.D., University of Pittsburgh; Associate Professor

Myrtle B. Sampson, B.S., M.L.S., North Carolina Central University; M.A., University of Michigan at Ann Arbor; M.Ed., Ed.D., University of North Carolina at Greensboro; Ph.D., Heed University; Associate Professor

Miriam Wagner, B.S., University of North Carolina at Greensboro; M.S., North Carolina A&T State University; Ed.D., University of North Carolina at Greensboro

Charles Williams, B.S., M.S., North Carolina A&T State University; Ph.D., Iowa State University; Professor

Department of Health, Physical Education and Recreation

Deborah J. Callaway, Chairperson

OBJECTIVES

The objectives of the Department of HPER are to provide:

1. instruction in a wide variety of physical education activities to meet the needs and interests of all students in the required general education program of the University;
2. recreational outlets for students and members of the University community through conduct of informal recreational activities;
3. enrichment programs through cooperation with other units of the University as the music and dramatic groups, alumni association, agricultural homemaking groups, guidance and health service divisions;
4. a wide range of movement experience which assist the individual in understanding and accepting himself/herself as a physical being;
5. opportunities for the individual to creatively express, explore, and apply his/her movement potential in the development of motor skills;
6. the prospective teacher opportunities to improve physical fitness and develop emotional stability and social skills for positive human relationships;
7. development of cognitive, psycho-motor, and affective behaviors necessary for careers as K-12 physical education teachers in North Carolina;
8. development of competencies essential for effective athletic coaching and leadership in extracurricula physical activities in the schools;
9. courses in health and physical education which meet State and national teacher certification standards;
10. necessary preparation for students planning careers as teachers of kindergarten, elementary, junior and senior high school physical education and athletic coaches and recreational administration;
11. courses in recreation which meet guidelines of National Recreational and Park Association.

DEGREES OFFERED

Health and Physical Education - Bachelor of Science

Recreation Administration - Bachelor of Science

*Health and Physical Education - Master of Science

*Physical Education - Master of Science

*See Graduate School Catalogue

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program in the Department of Health, Physical Education and Recreation is based upon the general admission requirements of the University. Formal admission to the Teacher Education Program normally begins at the completion of the Sophomore year and the general studies requirements. Physical Education majors must meet each of the criteria for admission to the Teacher Education Program.

DEPARTMENTAL REQUIREMENTS

Prior to admission to the Teacher Education Block, students should have the approval of their advisor.

All "D's" and "F's" received in **major** and **professional** courses must be repeated.

Physical Education majors are required to complete a 24 hour second major in a basic academic discipline. The second major options are Art, **Biology**, English, French, **History**, Mathematics, **Psychology**, and **Sociology**. These options in bold represent the recommended second major for the Department.

CAREER OPPORTUNITIES

The potential job market for Health and Physical Education majors appears to be promising for the persons who have equipped themselves with competencies that will give strength in areas allied to Health and Physical Education. The addition of the second concentration will also afford majors the opportunity to become more marketable in other teaching disciplines.

The potential for Recreation positions is growing rapidly.

CURRICULUM GUIDE FOR HEALTH AND PHYSICAL EDUCATION MAJORS

Freshman Year			
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH	3	MATH	3
HIST 100/204	3	HIST 101/205	3
Elective/Second Major	3	Natural Science	4
PHED 101	1	PHED 220	2
PHED 200	2	PHED 105	<u>1</u>
PHED 229	<u>1</u>		<u>16</u>
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
PSYC 320	3	Second Major	3
SPCH 250	3	CUIN 301	2
CUIN 300	2	BIOL 370	3
BIOL 369	3	PHED 231	1
PHED 270	1	PHED 240	2
PHED 271	1	PHED 272	1
	<u>16</u>	PHED 273	<u>1</u>
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 400	3	CUIN 436	3
PHED 442	2	PHED 420	2
PHED 448	1	PHED 440	2
PHED 462	3	PHED 445	2
PHED 470	2	PHED 471	2
Second Major	3	Second Major	3
Second Major	3	Elective/Second Major	3
	<u>17</u>		<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHED 563	2	CUIN 500	3
PHED 566	2	CUIN 533	3
PHED 569	3	CUIN 560	6
PHED 570	2	CUIN 624	<u>3</u>
Second Major	3		15
Second Major	<u>3</u>		
	15		

Total Credit Hours: 128

CURRICULUM GUIDE FOR HEALTH AND PHYSICAL EDUCATION (TEACHING) MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH	3	MATH	3
HIST 100/204	3	HIST 101/205	3
Elective	3	Natural Science	4
PHED 101	1	PHED 220	2
PHED 200	2	PHED 261	<u>1</u>
	<u>15</u>		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
PSYC 320	3	Second Concentration	3
SPCH 250	3	CUIN 301	2
CUIN 300	2	BIOL 370	3
BIOL 369	3	PHED 231	1
PHED 229	1	PHED 240	2
PHED 270	1	PHED 272	1
PHED 271	1	PHED 273	1
	<u>17</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CUIN 400	3	CUIN 436	3
PHED 442	2	PHED 420	2
PHED 448	1	PHED 440	2
PHED 462	3	PHED 445	2
PHED 470	2	PHED 471	2
Second Concentration	3	Second Concentration	3
Second Concentration	3	Elective/Second Major	3
	<u>17</u>		<u>17</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHED 563	2	CUIN 500	3
PHED 566	2	CUIN 533	3
PHED 569	3	CUIN 560	6
PHED 570	2	CUIN 624	3
Second Concentration	3		<u>15</u>
Second Concentration	3		
	<u>15</u>		

Total Credit Hours: 128

COURSES WITH DESCRIPTION IN HEALTH AND PHYSICAL EDUCATION

Health

PHED-200. Personal Health

Credit 2(2-0)

This course is designed to study personal health needs and problems. It emphasizes the acquisition of health knowledge and skills needed to critically analyze and evaluate health practices.

PHED-220. Community Health

Credit 2(2-0)

An introductory study of environmental factors which affect health. Emphasis will be placed upon the health of the group rather than that of the individual. Consumer health, community resources for health and prevention and control of disease through organized community efforts will be stressed.

PHED-440. Advanced Hygiene and Principles of Health Education Credit 2(2-0)

A comprehensive review of health facts and scientific principles applicable to the prospective teacher, the school child, and the community. Fundamentals of health promotion in the school program are considered. Prerequisites: PHED 200; 220.

PHED-442. First Aid and Safety Credit 2(1-2)

This course is designed to study emergency first aid course leading to American Red Cross certification in Standard First Aid and Cardiopulmonary Resuscitation. It also identifies practices and behaviors that promote safety in the home, school and community.

Physical Education

PHED-101. Health and Skill Related Physical Fitness Credit 1(0-2)

This course is designed to study the components and scientific principles of health and skill related physical fitness as they relate to wellness and lifetime fitness. It includes assessment and activities designed to improve physical fitness.

PHED-103. Introduction to Lifetime Physical Fitness Credit 1(0-3)

An introduction to the foundations of lifetime physical fitness and its related activities.

PHED-104. Weight Training Credit 1(0-2)

Introduction to weight training with emphasis on principles, techniques and development of individual programs.

PHED-105. Beginning Swimming Credit 1(0-2)

Beginning skills in swimming necessary to meet American Red Cross Level Three standards.

PHED-107. Racquetball Credit 1(0-2)

This course is designed to offer the student an opportunity to develop performance skills, an understanding of rules and strategies, and an appreciation for racquetball which one will be able to enjoy as a lifetime activity.

PHED-108. Beginning Springboard Diving Credit 1(0-2)

Introduction to the basic skills, knowledge and mechanics of springboard diving.

PHED-109. Fundamentals of Team Sports Credit 1(0-2)

To develop an understanding of the values and the logic behind exercise and sports activity and regular habits of exercise, to determine the physical fitness needs of the student with the nature, basic rules, techniques and skills of a wide variety of popular American sports and guide him into activities which will be of most interest and benefit him now and in the future.

PHED-110. Aerobic Training Credit 1(0-3)

Improvement of cardiovascular fitness through various forms of aerobic activity.

PHED-111. Fundamentals of Gymnastics Credit 1(0-2)

To develop an understanding of the basic skills and knowledge in the olympic-gymnastic events through a performance oriented experience. Students will perform on the vault, balance beam, parallel bars, horizontal bar, side horse, rings and floor exercise. The course provides a performance oriented gymnastic experience.

PHED-112. Fundamentals of Dance Credit 1(0-2)

To develop an understanding of the following concepts: Kinesthetic awareness of how body movement is controlled, and the elimination of muscular tension.

PHED-113. Beginning Tennis Credit 1(0-2)

A study of the basic skills and knowledge of tennis.

PHED-114. Beginning Golf Credit 1(0-2)

A study of the basic skills and knowledge of golf.

- PHED-115. Beginning Bowling** **Credit 1(0-2)**
A study of the basic skills and knowledge of bowling.
- PHED-116. Adapted Physical Activity** **Credit 1(0-2)**
Special activities for those students whose physical examination shows that they are unable to participate in the regular physical education program.
- PHED-117. Beginning Badminton** **Credit 1(0-2)**
A study of the basic skills and knowledge of badminton.
- PHED-118. Water Aerobics** **Credit 1(0-2)**
This course is a physical fitness course designed to develop cardiovascular endurance, muscular strength, endurance and flexibility via exercises in the swimming pool. Swimming skills are not required.
- PHED-133. Fundamentals of Athletic Training** **Credit 3(2-1)**
Practical application of athletic training principles and theory.
- PHED-201. Physical Fitness Training I** **Credit 2(0-5)**
Development and maintenance of health-related physical fitness. The training regimen includes cardiovascular endurance, muscular strength and endurance, muscular flexibility and body composition.
- PHED-202. Advanced Physical Fitness Training** **Credit 2(0-5)**
Development and maintenance of health-related physical fitness at an advanced level. Prerequisite: PHED 201 or consent of instructor.
- PHED-203. Weight Management** **Credit 2(1-2)**
A study of the principles and applications of proper weight management. It includes assessment, physiological and psychological aspects of weight control, and activities related to weight management.
- PHED-205. Intermediate Swimming** **Credit 1(0-2)**
Intermediate/advanced swimming skills necessary to meet American Red Cross Level Five standards. Prerequisite: PHED 105 or consent of instructor.
- PHED-207. Intermediate Racquetball** **Credit 1(0-2)**
Intermediate level racquetball skills, techniques and strategies. Prerequisite: PHED 107 or consent of instructor.
- PHED-213. Intermediate Tennis** **Credit 1(0-2)**
Intermediate level tennis skills, techniques and strategies. Prerequisite: PHED 113 or consent of instructor.
- PHED-214. Intermediate Golf** **Credit 1(0-2)**
Intermediate level golf skills, techniques and strategies. Prerequisite: PHED 114 or consent of instructor.
- PHED-215. Intermediate Bowling** **Credit 1(0-2)**
Intermediate level bowling skills, techniques and strategies. Prerequisite: PHED 115 or consent of instructor.
- PHED-229. Movement and Dance** **Credit 1(0-2)**
This course is designed to study basic locomotor and axial movements in dance. It includes group problem solving utilizing the elements of time, space and force to create dance works.
- PHED-231. Folk, Square, Social and Aerobic Dance** **Credit 1(0-3)**
This course is designed to study folk, square, social and aerobic dance. It includes basic dance steps, patterns, formations and cultural perspectives. A campus-based experience will be required.

PHED-234. Basketball, Field Hockey, and Softball**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of basketball, field hockey, and softball. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating.

PHED-235. Flag Football and Basketball**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of basketball, field hockey, and softball. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating.

PHED-237. Group Games and Outdoor Leisure**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of group games and outdoor leisure pursuits. It includes group games suitable for the gym, playground and camps; outdoor leisure pursuits such as camping, backpacking, firstbee, orienteering and canoeing.

PHED-238. Wrestling, Track and Field**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of wrestling, track and field. It includes history, terminology, skill, techniques, strategies and knowledge of rules and officiating.

PHED-240. Foundations of Physical Education**Credit 2(2-0)**

This course is designed to study the philosophical, historical, sociological, psychological and scientific foundations of physical education.

PHED-246. Tennis and Golf**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of tennis and golf. It includes history, terminology, skill techniques, strategies and knowledge of rules.

PHED-247. Recreational Games**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of archery, badminton, croquet, deck tennis, horseshoes, handball/racquetball, modified bowling and table tennis. It includes history, terminology, skill techniques, strategies and knowledge of rules.

PHED-251. Soccer and Volleyball**Credit 1(0-2)**

This course is designed to study the basic skills and knowledge of soccer and knowledge of soccer and volleyball. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating.

PHED-263. Rhythms**Credit 1(0-2)**

Suitable types of rhythmical activities for boys and men including fundamental movements, folk, tap, social dance and singing games.

PHED-270. Recreational/Group Games and Outdoor Leisure**Credit 1(0-2)**

This course is a study of the basic skills and knowledge of group games suitable for the gym, playground and camps; the recreational games of archery, badminton, croquet, deck tennis, frisbee, horseshoes, handball/racquetball, modified bowling and table tennis; outdoor leisure pursuits such as camping, backpacking, orienteering and canoeing. Prerequisite: Physical Education Majors Only.

PHED-271. Sports I**Credit 1(0-2)**

This course is a study of the basic skills and knowledge of football, soccer and volleyball. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating. Prerequisite: Physical Education Majors Only.

PHED-272. Sports II**Credit 1(0-2)**

This course is a study of the basic skills and knowledge of basketball, field hockey, softball, tennis and golf. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating. Prerequisite: Physical Education Majors Only.

PHED-273. Sports III**Credit 1(0-2)**

This course is a study of track and field, wrestling and intermediate swimming. It includes history, terminology, skill techniques, strategies and knowledge of rules and officiating. Prerequisite: Physical Education Majors Only.

PHED-420. Psychosocial Interactions of Human Movement**Credit 2(2-0)**

This course is a study of current psychological and sociological theories and research as they interrelate to human movement including group interaction, culture, aggression, self perception, racial background, sexism and economic status.

PHED-445. Kinesiology**Credit 2(1-2)**

This course is a scientific study of the mechanics and analysis of human movement, incorporating principles from the fields of physical education, anatomy, physiology and physics. Prerequisite: BIOL 469.

PHED-448. Gymnastics I**Credit 1(0-3)**

This course is designed to study basic skills, routines and knowledge of men's and women's gymnastics events. It includes history, terminology, skill techniques, evaluation and gymnastic related games.

PHED-458. Lifeguard Training**Credit 2(1-2)**

The acquisition of aquatic skills and knowledge to meet American Red Cross Lifeguard Training. It includes American Red Cross certification in Standard First Aid.

PHED-459. Water Safety Instructor**Credit 2(1-2)**

The acquisition of skills and knowledge to meet American Red Cross standards for Water Safety Instructor. It includes American Red Cross certification in Health Services Education.

PHED-462. Elementary School Physical Education**Credit 3(2-2)**

This course is a study of physical education for elementary school aged children with emphasis on planning, teaching and evaluating a program of developmental and movement activities. It includes analysis of developmental characteristics of children and principles of movement education relative to selection of age-appropriate activities and teaching methodologies. A clinical experience is required.

PHED-470. Theory and Practice of Sports I**Credit 2(1-2)**

This course is a study of the theory and practice of team sports; football, soccer, volleyball and the recreational games; archery, badminton, croquet, deck tennis, frisbee, horseshoes, handball/racquetball, modified bowling and table tennis. It includes analysis of performance skills, teaching techniques, officiating and a clinical experience. Prerequisites: 270, 271.

PHED-471. Theory and Practice of Sports II**Credit 2(1-2)**

This course is a study of the theory and practice of the team sports: basketball, field hockey, softball and the individual sports: tennis, golf, track and field, wrestling and swimming. It includes analysis of performance skills, teaching techniques, officiating and a clinical experience. Prerequisites: PHED 272, 273.

PHED-563. Adapted Physical Education**Credit 2(1-2)**

This course is a study of physical education for individuals with disabilities emphasizing identification, assessment and program development/learning as they apply to teaching and program planning. A field experience is required.

PHED-564. Minor Problems in Health and Physical Education**Credit 2(2-0)**

This course is designed primarily for seniors to provide them with an opportunity to investigate selected professional problems.

PHED-566. The Organization and Administration in Health and Physical Education

Credit 2(2-0)

This course is a study of effective planning, organization and management of health, physical education and recreation programs. It includes philosophy, management methods and techniques, curricular design and management of class and extra-curricular activities. Prerequisites: PHED 240, 470, 471.

PHED-569. Methods of Research and Evaluation in Health and Physical Education

Credit 3(2-2)

This study of tests and the application of measurement in the formative and summative evaluation of the teaching/learning process in health and physical education. Practice in selecting, administering, interpreting, and reporting results of fitness tests, skills batteries, motor performance measures, social qualities and attitude instruments, and special area knowledge tests. Basic methods of research used in the study of human movement. Includes the use and interpretation of statistics in health and physical education. Prerequisite: CUIN 436.

PHED-570. Exercise Physiology

Credit 2(1-2)

This course provides theoretical and practical experience in studying physiological concepts as they apply to acute and chronic effects of exercise on humans. Prerequisite: PHED 445; BIOL 469, 560.

CUIN-320-533. The Teaching of Health and Physical Education

Credit 3(3-0)

This course is a study of the teaching/learning process in health and physical education within the middle and secondary school. It emphasizes the planning, implementin, and evaluating of health and physical education activities within the school setting. Prerequisites: Admission to Teacher Education and Approval of the HPER Chairperson.

CURRICULUM GUIDE FOR RECREATION ADMINISTRATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	CHEM 100	3
MATH 101	3	CHEM 110	1
HIST 100	3	ENGL 101	3
BIOL 100	4	MATH 102	3
PHED 101	1	HIST 101	3
REC 160	3	PHED 200	2
	<u>17</u>	REC 260	<u>3</u>
			18

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 200	3	ENGL 201	3
SPCH 250	3	SOCI 204	3
PSYC 320	3	PHED 220	2
MATH 160	3	PHED 442	2
REC 402	2	PHED 231	1
SOC 100	3	PHED 105	1
	<u>17</u>	REC 408	2
		PHED 272	<u>1</u>
			15

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
REC 464	3	REC 463	3
ART 454	3	REC 465	3
POLI 210	3	PHED 205	1
ECON 301	3	REC 510	2
PHED 563	2	Electives	2
REC 509	2	SOCI 302	3
PHED 270	1		14
	<u>17</u>		

Summer Junior Year

REC 512 6 hrs.

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHED 566	2	REC 466	3
REC 571	3	BUAD 422	3
Elective	1	Elective	1
BUED 461	3	PSYC 420	3
PHED 569	3	PHED 458	2
	<u>12</u>		<u>12</u>

Total Credit Hours: 128

COURSES WITH DESCRIPTION IN RECREATION ADMINISTRATION

REC-512. Recreation Internship

Credit 6(6-0)

This supervised internship has been designed to allow students to acquire the knowledge, competencies and skills necessary for a successful performance in the field. It is recognized that classroom studies are not sufficient in and of themselves to prepare students for successful entry into the recreation profession. The opportunity to implement skills and knowledge in a practical situation is a necessary compliment to class experience. This internship is a minimum of ten (10) weeks of 400 clock hours in a recreation setting. Students will complete the experience after the majority of the classroom work has been finished, giving them the opportunity to apply learning gained through didactic studies.

REC-402. Field Experience I

Credit 2(0-4)

The first of four field experiences, consists of 40 clock hours of on-the-job experience with an approved Voluntary Youth-Service Agency that offers recreation and liesure services as a part of its programs. The student works through the agency in a variety of divisions to learn in-depth operations of the agency and the jobs entailed. Students spend two to four (2-4) hours per week during the semester working under supervision of a faculty advisor and an agency supervisor. Hours of service and specific jobs assigned and performed must be documented on departmental forms provided. These forms are submitted to the faculty advisor every Friday before 4:00 p.m.

REC-408. Field Experience II

Credit 2(0-4)

A continuation of knowledge and skill development of the recreation profession in a different agency. Students are assigned to a Government agency involved in recreation and liesure service delivery. They are required to spend 40 horus during the semester working two to

four (2-4) hours per week under the guidance of a faculty advisor and the agency supervisor. Hours of service and activities/tasks assigned and undertaken during the week must be documented and submitted to the faculty advisor each Friday before 4:00 p.m.

REC-160. Introduction to Recreation

Credit 3(3-0)

Foundations of recreation including the basic concepts underlying the organization of leisure and recreation activity.

REC-260. Community Recreation

Credit 1(0-2)

A study of city, state, and national organization. Practice in the general principles and techniques in the organization and promotion of leisure activities for home, school, and community. Field experience will include observations, service as aides and assistants.

REC-360. Introduction to Therapeutic Recreation

Credit 3(3-0)

Survey of key concepts, theoretical foundations, and procedures in clinical and community situations. Focuses upon varied special needs, populations, prescriptive activities, documentations using medical charting, medical and psychiatric terms.

REC-463. Principles and Practices of Outdoor Recreation

Credit 3(2-2)

Philosophy, organization administration and laboratory experiences in outdoor recreation.

REC-464. Group Leadership

Credit 2(2-0)

Techniques in group dynamics and methods of developing group leadership capabilities.

REC-465. Program Planning Recreation

Credit 3(3-0)

An analysis of recreation program. Emphasis is placed on objective, personnel and facilities.

REC-466. Camp Administration

Credit 3(3-0)

The organization and administration of camp activities. Programming camping activities that will apply to all ages and both sexes.

REC-509. Field Experience III

Credit 2(0-4)

This section of the field experience is with a Commercial/Industry Agency. It is designed to equip students with knowledge and practical skills required to operate recreation and leisure service as a business venture. Students are assigned to an approved Commercial/Industrial recreation agency for one semester to understudy the entire operations and workings of the enterprise. Each student is required to offer 40 hours of service during the semester, working two to four (2-4) hours a week under the supervision of a faculty advisor and agency supervisor. Students are required to document hours of work, details of assignments and any observations made during the week on forms provided by the Department. These forms are submitted to the faculty advisor every Friday before 4:00 p.m.

REC-510. Field Experience IV

Credit 2(0-4)

This is the last of the four field experiences. Students are assigned to a School/Education Agency to understudy its recreation and leisure service programs. They are required to spend 40 clock hours in the semester, working two to four (2-4) hours per week under the guidance of a faculty advisor and the agency supervisor. Hours of service, work schedules and details of activities/assignments undertaken during the week must be documented and submitted to the faculty advisor every Friday before 4:00 p.m.

REC-571. Supervision of Recreation and Park Services

Credit 3(3-0)

An analysis and investigation of supervision of employees involved in recreational services.

Advanced Undergraduate

PHED-651. Personal, School and Community Health Problems

Credit 3(3-0)

A study of personal, school and community health problems and resources. Emphasis is placed on the control of communicable diseases, healthful school living and the development of

individuals of the scientific attitude and a positive philosophy of healthful living. Field experiences will include: observations, service as aides and assistants.

PHED-652. Methods and Materials in Health Education for Elementary and Secondary School Teachers **Credit 3(3-0)**

A study of the fundamentals of the school health program, pupil needs, methods, planning instruction, teaching techniques, selection and evaluation of materials for the elementary and secondary programs, and the use of the community resources.

PHED-679. Prescribed Methods of Rehabilitating The Handicapped **Credit 3(3-0)**

A study of assessment and evaluation processes as it applies to individuals with disabilities. Emphasis will be placed on analysis of assessment tools, neurological bases of motor performance, interpretation of assessment results and program development.

DIRECTORY OF FACULTY

Timothy Abney, B.S., Lincoln University; M.S., North Carolina A&T State University; Lecturer
Paul K. Ankomah, B.A., University of Ghana, Legon; M.A., Wilfrid Laurier University; Ph.D., Texas A&M University; Assistant Professor

Willie Burden, B.S., North Carolina State University; M.S., Ohio State University; Ed.D., Tennessee State University; Adjunct Professor

Deborah Callaway, B.S., Virginia State College; M.Ed., Virginia Commonwealth University; Ed.D., Virginia Polytechnic Institute and State University; Associate Professor, Chairperson

James R. Coates, Jr., B.S., M.A., Ph.D., University of Maryland; Assistant Professor

Donald Corbett, B.S., Lincoln University; M.S., University of Illinois; Assistant Professor

Leonard Dudka, B.S., M.A., California State Polytechnic College; Ph.D., University of Illinois-Urbana; Associate Professor

John Eder, B.A., Guilford College; M.Ed., University of North Carolina-Greensboro; Lecturer

Joseph Godette, B.S., M.S.Ed., East Carolina University; Lecturer

Eleanor W. Gwynn, B.S., Tennessee State A. and I. University; MFA, University of N.C.-Greensboro; Ph.D., University of Wisconsin-Madison; Professor

William Hayes, B.S., North Carolina Central University; M.S., North Carolina A&T State University; Lecturer

Keith Henry, B.S., Catawba College; M.A., North Carolina A&T State University, Lecturer

Victor Karabin, B.S., Westchester State College; M.S., University of Illinois; Instructor

Gloria M. Palma, B.S.E., University of the Philippines; M.S., Ph.D., Washington State University; Associate Professor

William J. Pope, B.S., University of Kansas, Lawrence; Lecturer

Robert M. Pulliam, B.S., University of Tennessee; M.A., Fayetteville State University; Lecturer

Tova Rubin, B.F.A., Philadelphia College of Art; M.A., Adelphi University; Ph.D., Temple University; Assistant Professor

Roy C. Thomas, B.S., M.S., Baylor University; Lecturer

William B. Utter, B.S., State University of New York; M.Ed., The University of North Carolina at Chapel Hill; Ed.D., The University of North Carolina at Greensboro, Associate Professor

Richard L. Watkins, B.S., High Point College; M.S., N.C. A&T State University; Instructor

SCHOOL OF TECHNOLOGY

Earl G. Yarbrough, Dean
Ray Davis, Assistant Dean

The primary focus of the School of Technology is to prepare individuals who are uniquely proficient in the application of basic science and technology. Thus, faculty of the school are interested in what industry, business and education want and need. As a result, our goal is to educate the whole person. Students develop not only their technical skills but their personality, cooperativeness, innovativeness, concern for the organization, communications skills and dependability. Graduates of the school are equipped to meet the new and emerging challenge of a modern high technological society.

Curriculum and programs of the school are continually reviewed by advisory groups associated with the various professions represented by the school. Based upon this input, the curriculum is reflective of what business, industry and education need.

Programs of the school that are designed to prepare individuals for industry are built upon a technical-management orientation. Thus, graduates pursue career opportunities in a variety of fields ranging from research and design to inspection, distribution and service. Graduates are employed as project managers, quality control engineers, operation officers, shift superintendents, employment managers, safety engineers, occupational health specialists, construction managers, loss prevention representatives, etc.

Several of the programs of the school are designed to prepare individuals for a variety of educational careers. Thus, graduates of the school are employed as technology education or industrial vocational education instructors at the secondary and post-secondary levels. In addition, many graduates of the education program are employed in the private and governmental sector in a variety of occupational areas.

The specific objectives of the school are:

1. To provide an environment which nurtures individual development and creativity through scholarly pursuits;
2. To provide a basic knowledge of management skills and problem solving techniques;
3. To develop scientific and technological proficiency through organized instruction and research;
4. To prepare persons to secure positions in industrial-technical training and teaching at the secondary and post-secondary level;
5. To prepare persons to secure positions of a technical-management nature in business, industry, and government; and
6. To provide advanced technological competencies and leadership in the utilization of computers in industry, business, and technical settings.

ACCREDITATION

The undergraduate program in Industrial Technology with a concentration in Graphic Communication Systems and Construction Management along with the Electronics Technology and Manufacturing Systems programs are accredited by the National Association of Industrial Technology (NAIT). The programs in Technology Education are accredited by the National Council For Accreditation of Teacher Education (NCATE) and approved by the State Department of Public Instruction (SDPI). The Technology Education program is also certified by the International Technology Education Association (ITEA).

DEGREES OFFERED

Industrial Technology - Bachelor of Science

Concentrations:

Construction Management

Graphic Communication Systems

Electronics Technology - Bachelor of Science

Manufacturing Systems - Bachelor of Science

Occupational Safety and Health - Bachelor of Science

Technology Education - Bachelor of Science

Vocational Industrial Education - Bachelor of Science

Technology Education - Master of Science

Vocational Industrial Education - Master of Science

Industrial Technology - Master of Science

GENERAL PROGRAM REQUIREMENTS

Admission requirements for entering students in the School of Technology are the same as those for the University. Transfer students must have a 2.0 GPA overall. Requirements for graduation vary from department to department. Students are responsible for meeting all academic requirements for graduation established by both the University and their chosen department.

Community college and technical institute graduates as well as other transfer students may be admitted to undergraduate programs in Industrial Technology, Electronics, Manufacturing and Vocational Industrial Education with advanced classification by submitting their credentials to the University admissions office. The school also has several 2+2 agreements with area community colleges. The maximum number of transfer credits allowed with the Associate Degree Program is 63 semester hours or approximately junior status.

Department of Manufacturing Systems

Abhay V. Trivedi, Chairperson

OBJECTIVES

The Department of Manufacturing Systems features a program of study designed to prepare "management-oriented technical professionals" with practical knowledge, skills and training to serve the manufacturing enterprise systems. A Bachelor of Science degree program is offered in the area of Manufacturing Systems.

The degree program is accredited by the National Association of Industrial Technology (NAIT). Curriculums are designed to study industrial production processes and systems associated with manufacturing industries, emphasizing the *application* and *control* of technical procedures. Study of materials and processes, machine-tool technology, robotics and computer controlled systems; along with the ability to plan, organize, and manage the production system; and, to integrate the facilities and human resources for producing quality products with high efficiency and productivity is the major academic emphasis of the department.

The Bachelor of Science in Manufacturing Systems emphasizes practical applications, applied research and innovative skill development in a high technology manufacturing envi-

ronment involving, CAD, CAM, NC/CNC, CIM, Robotics and JIT. This is an innovative degree program for the 21st century.

DEGREES OFFERED

Manufacturing Systems - Bachelor of Science
Industrial Technology - Master of Science

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program in the Department of Manufacturing Systems is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Technology majors must complete 126 semester hours of university courses. A minimum of 30 semester hours must be completed in technical specialization in manufacturing. A minimum grade of "C" must be earned in all major courses.

Graduates of technical institutes and community colleges who have earned the Associate Degree in technology areas may be admitted to the Manufacturing Systems program as juniors. Specific course requirements for these students will have to be made on an individual basis after their previously earned credits have been assessed. The typical student in this program will be required to take at least 63 additional semester hours.

Any student transferring to the Department of Manufacturing Systems from other disciplines must have a minimum of 2.0 GPA.

ACCREDITATION

The Manufacturing Technology program is accredited by the National Association of Industrial Technology.

CAREER OPPORTUNITIES

Graduates of our Manufacturing program are very successful in receiving employment in industrial and service areas. Positions typically include supervision, technical management, engineering, technical sales, customer relations, service management, production engineering, quality control, automation and high-technology application areas.

CURRICULUM GUIDE FOR MANUFACTURING SYSTEMS MAJORS

Freshman Year			
<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
CHEM 100	4	GCS 234	3
GCS 133	3	MFG 191	3
MFG 100	1	MFG 276	3
	<u>15</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225	4	PHYS 226	4
Social Science Elective ¹	3	Social Science Elective ¹	3
ECT 211	3	MFG 470	3
MFG 293	3	MFG 471	3
GCS 292	3	ECT 101	3
	<u>16</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MFG 300	1	Humanities Elective ²	3
PHED	2	PSYC 445	3
BUAD 422	3	ACCT 221	3
Humanities Elective ²	3	MFG 493	3
MFG Specialization ³	3	MFG Specialization ³	3
SPCH 250	3	Free Elective	3
	<u>15</u>		<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MFG 495	3	CM 593	3
CM 592	3	Free Elective	6
MFG Specialization ³	9	MFG Specialization ³	6
	<u>15</u>		<u>15</u>

Total Credit Hours: 126

¹ Social Science Elective (6 hrs) may include recommended African-American courses, HIST 205, or HIST 220.

² Humanities Elective (6 hrs) may include recommended African-American courses, ENGL 200 or ENGL 201.

³ Manufacturing Specialization includes Mfg. 276 and 27 semester hours of recommended courses from automation system, polymer science/material science, or technical management blocks.

COURSES WITH DESCRIPTION IN THE MANUFACTURING SYSTEMS DEPARTMENT

MFG-100. Orientation to Technology **Credit 1(1-0)**

An overview of the School of Technology and its programs are explained along with what is expected of majors, their preparation, and the opportunities available upon graduation. Basic concepts such as dependability, dedication, technical knowledge, communications, cooperativeness, self-motivation, and dressing for success are discussed.

MFG-191. Introduction to Manufacturing Processes **Credit 3(2-2)**

An introduction to basic manufacturing processes to include forming, separation conditioning, and assembly processes. An overview of production management and metrology is introduced.

MFG-251. Internal Combustion Engine **Credit 3(1-3)**

A study of principles, design and chemistry of combustion as it relates to performance, fuel, economy and emissions.

- MFG-252. Automotive Legislation for Consumers** **Credit 3(2-2)**
A study of State and Federal rules and regulations governing the automotive industry.
- MFG-254. Automation Identification & Bar Coding** **Credit 3(1-3)**
Science of measurement, inspection and bar coding through automation.
- MFG-255. Automotive Power Transmission** **Credit 3(1-3)**
A study of fundamental principles of the automotive power train components. Emphasis on mechanical and fluid power principles, transmitting power, controlling components, brakes, steering, and etc.
- MFG-275. Automotive Emmission** **Credit 3(2-2)**
A study of mobile air pollution sources as it relates to gasoline powered vehicles. A familiarization of the causes and effects of auto exhaust emission.
- MFG-276. Introduction to PLC's and Robotics** **Credit 3(1-3)**
A study of sensors, computers and activators as a feedback system in the control of fuel, spark and emission control system.
- MFG-293. Power Technology** **Credit 3(1-3)**
Basic concepts of energy and power technology, including mechanical, hydraulics, pneumatics and electrical methods of transmitting and controlling power sources.
- MFG-300. Technology Seminar** **Credit 1(1-0)**
This course is designed to review and acquaint students with the necessary skills to present themselves and their credentials to various groups. Video/oral presentation as well as written and computer generated graphic presentations will be made.
- MFG-451. Automotive Instrumentation** **Credit 3(1-3)**
A study of the design and diagnostic application of automotive testing equipment.
- MFG-452. Automotive Service Management** **Credit 3(2-2)**
An introduction to automotive service management. Emphasis is on the application of management skills, techniques, methods of problem solving for efficient and effective management and marketing controls.
- MFG-455. Image and Data Processing Technology** **Credit 3(1-3)**
A study of the techniques and processes of collecting, analyzing, manipulating and disbursement of automotive data using electronic devices and systems.
- MFG-456. Energy, Power, Instrumentation & Control** **Credit 3(1-3)**
An advanced study of energy and power transmission and the integration of electro-mechanical fluid power for instrumentation and control.
- MFG-470. Industrial Materials and Processes** **Credit 3(1-3)**
Nature, origin and the conversion into manufactured goods of metals, plastics, woods, ceramics, composites and synthetic materials.
- MFG-471. Metallic Material Processes** **Credit 3(1-3)**
A study of metallic material properties, fabricating equipment and methods utilized in the production of metallic products.
- MFG-472. Numerically Controlled Machine-Tool Technology** **Credit 3(1-3)**
Basic manufacturing processes with computer-numerically controlled (CNC) machine-tools. Includes programming and machine language.
- MFG-473. Advanced CNC-Machine-Tool Technology** **Credit 3(1-3)**
Advanced numerically controlled (CNC) machine-tool technology with precision work performed on lathes, milling machines, laser machining and surface drilling work stations.

MFG-474. Polymer Process I**Credit 3(1-3)**

A fundamental lecture-laboratory course concerning properties and use of polymers in manufactured products. The laboratory includes polymer identification.

MFG-475. Polymer Process II**Credit 3(1-3)**

This is an advanced course dealing with the use of polymers in manufacturing process. The course is laboratory-oriented to provide experience with injection molding, extrusion, blow molding, rotational casting, thermoforming and other basic plastics processes. Also included is tooling design of injection molds, compression molds and dies.

MFG-480. Mechanical Design and Manufacturing Problems**Credit 3(1-3)**

A basic course in mechanical design, problems and manufacturing procedures. Course includes machine-tool-die design using CAM software to generate machine codes and parts drawing.

MFG-481. Metallurgy**Credit 3(2-2)**

Metals, their properties, selection, and production are studied. Phase diagram, thermal treatment and strengthening mechanism are discussed. Lab exercises will cover specimen preparations, metallography techniques, and microstructural analysis.

MFG-491. Statics & Mechanics of Materials**Credit 3(2-2)**

A study of static equilibrium conditions and mechanical behavior of materials under loading. Applications are made in the area of bars, columns, joint pressure vessels, shafts and beams. Testing materials for measuring mechanical properties will be experienced.

MFG-493. Manufacturing Planning and Management**Credit 3(2-2)**

A practical approach to management to include organizing, planning, controlling and development of operations used in decision making and problem solving in a manufacturing environment.

MFG-495. Statistical Process/Quality Control**Credit 3(2-2)**

A practical approach to quality control in industries. Includes quality and process improvement through measurement analysis and diagnosis utilizing basic concepts of statistics.

MFG-496. Electro-Mechanical Control Systems**Credit 3(1-3)**

A general study of electro-mechanical control systems. Emphasis will be placed on programming PLC's, robots and interfacing sensors, transducers, etc., with other components for output signals. PC computers will be an integral part of this class.

MFG-497. Cooperative Training in Industry I**Credit 3(3-0)**

Students must be in industry full time for one semester in their major field of work and complete any university co-op requirements. The student will be evaluated on reports from industry. The report will be in standard format. The hours earned will be credited towards required technical electives in the Industrial Technology curriculum. Three semester hours is the maximum to be earned under this arrangement in any one semester. Six semester hours is the maximum to be earned in the co-op arrangement in the Industrial Technology curriculum.

MFG-498. Cooperative Training in Industry II**Credit 3(3-0)**

The description of this course is the same as MANU-497: Cooperative Training in Industry I, and is normally the second co-op experience of the student.

MFG-576. Manufacturing-Production and Control**Credit 3(2-2)**

A comprehensive study of manufacturing operation and production control. Includes materials handling and just-in-time manufacturing (JIT), manufacturing requirement planning (MRP I & II) and continuous flow manufacturing.

MFG-591. Early Manufacturing Involvement**Credit 3(2-2)**

A comprehensive study of Early Manufacturing Involvement (EMI) to include product value analysis, parametric cost estimates, scheduling and economic justification of product release.

MFG-596. Automated Manufacturing**Credit 3(1-3)**

A basic understanding of automation and its various applications in manufacturing. Implications of Computer Integrated Manufacturing (CIM) and robotic work cells towards improving productivity is emphasized.

MFG-599. Independent Study**Credit 3(3-0)**

The student selects a technical problem in his major area for special research and study in consultation with a faculty member in his area of interest. He will spend a minimum of 6 hours per week in library research or laboratory experimentation. A technical report in standard format will be required for completion and must be approved by two department faculty members.

MFG-651. Principles of Robotics**Credit 3(1-3)**

Study of robotics principles and logic control manipulators towards the total integration into a flexible manufacturing system.

MFG-673. Industrial Productivity Measurement and Analysis**Credit 3(2-2)**

Study of work measurement and method analysis towards establishing work standards and measuring productivity in industries.

MFG-674. Study of Automation and Control System**Credit 3(1-3)**

Study of automation and control system to include application of PLC, CAD, CAM, CNC, sensors and robotics to simulate a total computer-integrated-manufacturing (CIM) environment.

MFG-690. Special Problems in Manufacturing Systems**Credit 3(0-4)**

Intensive study in the field of Industrial Technology under the direction of a faculty advisor.

DIRECTORY OF FACULTY

William K. James, B.S., Iowa State University; M.S., DIT, University of Northern Iowa; Assistant Professor

Cheng-Hsin Liu, B.S., Tunghai University, Taiwan; M.S., University of Oklahoma, Norman; Ph.D., Auburn University; Assistant Professor

John H. Morris, B.S., Johnson C. Smith University; B.S., A&T State University; M.A., N.C. State University; Ph.D., Iowa State University; Associate Professor

Russell Rankin, Jr., B.S., A&T State University; M.S., North Carolina State University; Assistant Professor

Mansur Rastani, B.S., Aryamehr Institute of Technology; M.S., Center for Graduate Studies and Research; Ph.D., N.C. State University; Associate Professor

Sheng-Hsien Teng, B.S., Chung Yoon University, Taiwan; M.S.I.E., Texas Tech University, Ph.D., Auburn University; Associate Professor; P.E.

Marcus D. Tillery, B.S., North Carolina A&T State University; M.S., Ph.D., Iowa State University; Assistant Professor

Abhay V. Trivedi, B.S., M.S., Ph.D., North Dakota State University; Professor and Chairperson

Earnest L. Walker, B.S., University of Arkansas, Pine Bluff; M.S., University of Arkansas, Fayetteville; Ph.D., Southern Illinois University; Associate Professor

Department of Graphic Communication System and Technological Studies

Robert B. Pyle, Chairperson

OBJECTIVES

The major objective of the Department of Graphic Communication Systems and Technological Studies (GCSTS) is to provide quality competency-based instruction so that men and women will be prepared to enter the fields of technology education, graphic communication systems, and vocational industrial education. In addition, the Department assists majors in developing those critical competencies in the sciences, communications, mathematics, and technical specialties essential to securing positions in related industrial, business and government careers.

DEGREES OFFERED

Technology Education - Bachelor of Science
Vocational Industrial Education - Bachelor of Science
Industrial Technology - Bachelor of Science
Concentration: Graphic Communication Systems

*Technology Education - Master of Science

*Vocational-Industrial Education - Master of Science

*See the Graduate School Bulletin.

GENERAL PROGRAM REQUIREMENTS

Student admission to undergraduate degree programs in the Department of GCSTS is based on general admission requirements of the University.

Admission, retention, and state certification of students in Technology Teacher Education programs are based on policies described in the School of Education section of the Bulletin.

Persons with technical preparation and interest in post secondary vocational technical education or technical training programs in private industry or business which do not require teacher certification may pursue a bachelors degree in the Department of GCSTS. Students pursuing this option will not be recommended or qualified to receive teacher certification in North Carolina. In addition, they will be required to sign a waiver acknowledging that they are not seeking recommendation for teacher certification in North Carolina.

Community college and technical institute graduates and other transfer students may be admitted to undergraduate Graphic Communication Systems & Technological Studies programs with advanced classification by submitting credentials to the University Admissions Office for individual assessment. Maximum transfer credit from Associate Degree technical programs is 64 semester hours or approximately junior status. Students transferring to the Department of GCSTS from other disciplines must have a minimum of 2.0 G.P.A.

DEPARTMENTAL REQUIREMENTS

Technology Education Major: Students must complete 128 semester hours, which include general studies, professional education, major courses, second major concentration and electives. Included in the major sequence are technical electives. The grade point average in major courses must be 2.0 or better.

Vocational Industrial Education Major: Students must complete 128 semester hours, which include general studies, professional education, major courses, second major concentration and electives. Included in the major sequence are technical electives concentrated in one of the following seven optional cluster areas listed below:

Construction Industries
Drafting and Graphic Industries
Electronic Industries
Manufacturing Industries
Service Industries
Transportation Industries
Printing Industries

The grade point average in major courses must be 2.0 or better.

For persons who possess prior technical transfer credits or work experience in recongnized areas of trade and industrial education, further technical sub-options are available within the cluster areas above. Such students will pursue individualized programs tailored to meet their specific needs, provided the following conditions are satisfied:

1. The area selected for a technical concentration in the major must be recognized by the North Carolina State Department of Public Instruction for Trade & Industrial teacher certification.
2. The student must initially enter the program with advanced classification.
 - * Persons holding an Associate Degree in the technical field may apply such transfer credits toward meeting technical course requirements.
 - * Persons meeting University admission requirements desiring to substitute work/trade experience to meet technical course requirements in the field selected may receive college credit by satisfactory completion of a competency- based examination.

Industrial Technology Graphic Communication Systems Concentration Majors. Students are required to complete 126 semester hours of university course work. A minimum of 30 semester hours must be completed in the technical specialization. A minimum grade of "C" must be earned in all major courses.

Students must maintain a grade point average of 2.0 or better for all course work.

NOTE: Transfer students and persons applying college credits earned through competency examinations may apply a maximum of 24 semester hours of credit toward meeting technical course requirements in degree programs.

ACCREDITATION

The Technology Education programs are accredited by the National Council for Accreditation of Teacher Education and are approved by the North Carolina Department of Public Instruction. The Technology Education Program is certified by the International Technology Education Association (ITEA). The Industrial Technology-Graphic Communication Systems concentration program is accredited by the National Association for Industrial Technology (NAIT).

CAREER OPPORTUNITIES

Excellent employment opportunities exist for persons trained in Technology Education. Public schools (K-12), community colleges, technical institutes, colleges, and universities are in constant need of securing qualified teachers in Technology Education. Teaching posi-

tions continue to remain open for Technology Education specialists and shortages of personnel are reported in many states. Schools are experiencing major difficulty in locating competent persons to fill Technology Education vacancies.

In addition to teaching many career opportunities exist for Vocational-Industrial Education graduates. These include industrial-business enterprises, government agencies, rehabilitation and manual arts therapy centers, private school and recreational camps. Vocational Industrial Education graduates are employed as training directors, managers, supervisors, engineering assistants, sales, and safety personnel.

Graduates of the Industrial Technology Graphic Communications concentration program option have a variety of career options in management, production, design, or sales. A range of opportunities are available in photography, design, advertising, in-plant printing, and publishing.

CURRICULUM GUIDE FOR TECHNOLOGY EDUCATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
TECH 218	3	TECH 412	3
TECH 414	3	HIST 204	3
SPCH 250	3	MATH 112	4
MATH 111	4	TECH 382	3
	<u>16</u>	TECH 211	<u>1</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 205	3	HIST 250	3
TECH 415	3	TECH 413	3
PHYS 225	3	GCS 234	3
PHYS 235	1	ECT 211	3
GCS 133	3	PHED 200	2
Natural Science Elective	4	Humanities Elective	3
	<u>17</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HIST 303	3	MFG 293	3
GCS 263	3	HIST 304	3
MFG 472	3	HIST 310	3
PSYC 320	3	TECH 672	3
PHED Elective ³	1	TECH 416	3
Humanities Elective	3	HIST 220	3
	<u>16</u>		<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
TECH 462	3	CUIN 560	6
HIST 311	3	CUIN 624	3
TECH 510	3	TECH 566	3
CUIN 400	3		12
CUIN 436	3		
	<u>15</u>		

Total Credit Hours: 128

CURRICULUM GUIDE FOR VOCATIONAL INDUSTRIAL EDUCATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GCS 133	3	GCS 234	3
TECH 218	3	ENGL 101	3
ENGL 100	3	HIST 204	3
MATH 111	4	MATH 112	4
SPCH 250	3	TECH 382	3
	<u>16</u>	TECH 211	1
			<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Technical Specialty Elective ¹	3	Technical Specialty Elective ¹	3
PHYS 225	3	Humanities Elective ²	3
PHYS 235	1	BIOL 100	4
Humanities Elective ²	3	SOCI 100	3
HIST 205	3	ECON 300	3
HIST 250	3	PHED 200	2
	<u>16</u>		<u>18</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Technical Specialty Elective ¹	3	Technical Specialty Elective ¹	3
GCS 263	3	Technical Elective ⁴	3
TECH 669	3	TECH 672	3
PSYC 320	3	HIST 304	3
HIST 303	3	HIST 311	3
PHED Elective ³	1		15
	<u>16</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Technical Specialty ¹ Elective ¹	3	TECH 566	3
TECH 510	3	CUIN 560	6
CUIN 400	3	CUIN 624	3
CUIN 436	3		<u>12</u>
HIST 220	3		
HIST 310	3		
	<u>18</u>		

Total Credit Hours: 128

¹ *Technical Specialization Areas (15-21 s.h. required)*

Construction Industries

GCS 334 Archit. Drafting
 CM 215 Residential Const.
 CM 216 Com./Ind. Const.
 CM 217 Const. Estimating
 CM 412 Mech. Sys. for Bldgs.
 CM 413 Prin. of Const. Mgmt.

Drafting and Graphic Industries

GCS 133 Drafting Tech. I
 GCS 234 Computer Aided Drafting
 GCS 333 Elect./Electronic Draft.
 GCS 334 Architectural Drafting
 GCS 434 Adv. Archit. Drafting
 GCS 533 Machine Design Drafting
 GCS 536 Tool and Machine Design
 GCS 631 Advanced CAD
 GCS 534 Cartographic Drafting & Design

Electronic Industries

GCS 333 Elect./Electronic Draft
 ECT 211 Electricity & Electronics
 ECT 231 Electronic Comm. Circuits
 ECT 430 Industrial Electronics
 ECT 431 Digital Logic Circuits
 ECT 432 Elect. Microprocessor

Service Industries as approved by advisor

Manufacturing Industries

GCS 133 Drafting Tech. I
 MFG 191 Intro. Mfg. Processes
 MFG 472 Num. Cont. Mach.-Tool Tech.
 MFG 474 Polymer Processes I
 MFG 480 Mech. Design & Mfg. Prob.
 MFG 481 Metallurgy
 MFG 491 Statics & Mech. of Mat.
 MFG 495 Stats. Process/Qual. Control
 MFG 596 Automated Mfg.

Transportation Industries

GCS 133 Drafting Tech. I
 MFG 251 Internal Combust. Engine
 MFG 276 Concepts of Elect. Ctrl. Sys.
 MFG 452 Automotive Svc. Mgmt.
 MFG 456 Energy Power Instru. & Ctrl.
 MFG 496 Electro/Mechanical Ctrl. Sys.

Printing Industries

GCS 110 Designing for GC
 GCS 130 GC Technology
 GCS 330 Intro. to Photographic Imaging
 GCS 331 Adv. Photographic Imaging
 GCS 575 Principles of Ink Technology
 GCS 580 Principles of Paper Technology
 GCS 616 Electronics Imaging in GC

² *Humanities Elective (6 hrs.) any elective in Humanities (see University Course Requirements)*

³ *PHED elective (1 hr.) any elective in PHED*

⁴ *Technical Elective - any elective in Technology*

**CURRICULUM GUIDE FOR INDUSTRIAL TECHNOLOGY
GRAPHIC COMMUNICATIONS
CONCENTRATION MAJORS**

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
CHEM 101, 111	4	GCS 234	3
GCS 133	3	ART 228	3
MFG 100	<u>1</u>	GCS 263	<u>3</u>
	15		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225/235	4	Natural Sci. Elective	4
HIST 205	3	HIST 220	3
ECT 230	3	ART 450	3
GCS Specialty Elective	3	GCS Specialty Elective	3
GCS Specialty Elective	<u>3</u>	GCS Specialty Elective	<u>3</u>
	16		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ACCT 221	3	PSYC 445	3
PHED 200	2	BUAD 430**	3
Humanities Elective	3	GCS 292	3
SPCH 250	3	GCS Specialty Elective	3
GCS Specialty Elective	3	Free Elective	<u>3</u>
GCS Specialty Elective	<u>3</u>		15
	17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MFG 495	3	CM 593	3
GCS 585	3	Free Elective	3
GCS Specialty Elective	3	GCS Specialty Elective	3
GCS Specialty Elective	3	GCS Specialty Elective	3
Free Elective	<u>3</u>	Humanities Elective	3
	15	MFG 300	<u>1</u>
			16

Total Credit Hours: 126

SPECIALIZED INDUSTRIAL TECHNOLOGY GRAPHIC COMMUNICATION CONCENTRATION COURSES (36 S. H. Required)

Select courses from the following areas:

Computer Aided Drafting/Design

GCS 133 Intro. to Drafting
GCS 233 Drafting Tech. I
GCS 234 Computer Aided Drafting
GCS 333 Electric/Electronic Drafting
GCS 334 Architectural Drafting
GCS 430 Tech. Illustration and Design
GCS 433 Industrial Design I
GCS 434 Adv. Architectural Drafting
GCS 435 Arch. Design and Modeling
GCS 533 Machine Design Drafting
GCS 534 Comp. Aided Draft. & Design
GCS 536 Tool and Machine Design
GCS 610 Internship in Industry I
GCS 611 Internship in Industry II
GCS 631 Adv. Computer Aided Design

Printing/Publishing

GCS 110 Designing for GC
GCS 130 Graphic Communications Tech.
GCS 292 Technical Communications
GCS 330 Intro. to Photographic Imaging
GCS 331 Adv. Photographic Imaging
GCS 575 Principles of Ink Technology
GCS 580 Principles of Paper Technology
GCS 585 GC Production Management
GCS 590 Estimating in GC
GCS 610 Internship in Industry I
GCS 611 Internship in Industry II
GCS 616 Electronic Imaging in GC
GCS 630 Photography and Ed. Media
GCS 635 Adv. Principles of GC Tech.

****Student must have completed 64 semester hours to enroll in BA 430.**

COURSES WITH DESCRIPTIONS IN THE GRAPHIC COMMUNICATION SYSTEMS AND TECHNOLOGICAL STUDIES DEPARTMENT

GCS-110. Designing for Graphic Communications

Credit 3(2-2)

This course will acquaint the student with the basic principles and practices in the layout and design of graphic communication products. Mechanical and computer assisted processes will be introduced. Laboratory work is required for this course.

GCS-130. Graphic Communications Technology

Credit 3(2-2)

Basic principles of graphic design, pre-press preparation, reproduction methods, and bindery operation are taught in a laboratory setting. Historical, socio-economic, organizational and career opportunities in graphic communications and allied industries are investigated in reference to graphic communications, business and industries. Laboratory is required. Prerequisite: TECH 110.

GCS-133. Introduction to Drafting Technology

Credit 3(1-4)

Basic orthographic projection is emphasized. This course is an introduction to drafting technology tools and procedures. Other topics include lettering, geometric construction, pictorials, auxiliaries, sections, and dimensioning.

TECH-210. General Crafts

Credit 3(2-3)

Fundamentals of materials, tools, and skills used in various recreational and developmental craft activities are stressed in this course.

TECH 211. Seminar in Technology Education

Credit 1(1-0)

Provides actual classroom observations of the public school environment. Students will meet in a seminar to discuss their observations relative to current research and trends in technology education in the public schools.

TECH 218. Introduction to Technology**Credit 3(2-2)**

Use of the anthropological approach in studying the evolution of technology and its impact on tool development and technological processes. Student will develop problem-solving and manipulative skills through "hands-on" activities in a multiple activity laboratory. The activities will be developed/designed around the technological systems of communication, manufacturing, transportation, and construction. Student will also develop leadership skills through his/her involvement in the Technology Education Collegiate Association activities.

GCS-233. Drafting of Geometrical Entities**Credit 3(1-4)**

This course will emphasize representation of common geometrical entities with points, lines, planes, solids, sectional auxiliary projection, revolution, pictorial drawing, intersection and development. Prerequisite: GCS 133 or consent of advisor.

GCS-234. Computer Aided Drafting**Credit 3(1-4)**

An introduction to computer aided design software and its application in the industrial workplace are presented. Prerequisite: GCS 133.

TECH-261. Introduction to Industrial Education**Credit 3(3-0)**

Designed to acquaint the student with the underlying philosophy, basic principles, and history of industrial arts and vocational education; this course also includes planning, organizing, administering, supervising, evaluating vocational and industrial education/technology programs; with special emphasis given to organization and responsibilities of national, state, and local agencies.

TECH-263. Evolution and Social Implications of Technology Education**Credit 3(3-0)**

Study of technology systems. Investigation of past and present impact on the individual and society. Potential of future change influenced by technological change and application is addressed through technological assessment and forecasting.

GCS-292. Technical Communication**Credit 3(3-0)**

This course is designed to develop the student's proficiency in researching, organizing, writing, and presenting documents in various areas of technology. Prerequisites: ENGL 100, 101.

GCS-330. Introduction to Photographic Imaging**Credit 3(2-2)**

This course is designed to acquaint the beginner with the fundamental processes of photographic imaging. Historical evolution and modern uses of photography will be studied. Nomenclature, theory and application in picture composition, imaging, and presentation methods will be explored. Legal, safety, and marketing aspects of photography will be addressed. Each student is required to provide a camera with adjustable f-stops and shutter speeds. Laboratory is required.

GCS-331. Advanced Photographic Imaging**Credit 3(2-2)**

Basic principles of pre-press imaging for mass reproduction purposes are highlighted and reinforced in a laboratory setting. Theories of production, line and halftone copy are applied in class. Examination of alternative technical systems for pre-press image preparation. Laboratory is required.

GCS-333. Electric/Electronic Drafting**Credit 3(1-4)**

Emphasis is on drawing and design of electronic equipment and devices found in the manufacturing, installation, and maintenance industries. Topics include: symbols, basic circuits, industrial controls, wiring diagrams, printed circuits, integrated circuits, and electrical building construction wiring diagrams. Prerequisite: GCS 234.

GCS-334. Architectural Drafting**Credit 3(1-4)**

Principles of planning residential structures and developing production working drawings are stressed. Course topics include the design of: floor plans, environmental system layouts

(heating and air conditioning), and service system plans (plumbing and electrical). Additionally, issues concerning cost estimation, building codes, and general construction techniques will be introduced.

TECH-382. Programming “Basic” for Technology Education **Credit 3(3-0)**

An introduction to Basic Programming Language is the focus. The objectives are: to acquaint the student with proper and correct way to design and write programs using Basic Language, to teach problem solving techniques, to emphasize interactive applications, to encourage independent study, and to provide practical problems to illustrate the application in academic and real world environments.

TECH-412. Introduction to Construction Systems **Credit 3(1-4)**

An introduction to the significance of the evolution of construction and construction systems on human and societal development. An analysis of constructed items such as roadways, low and high rise buildings, tunnels, bridges, dams, towers and other structures. Specific emphasis will be placed on the construction process and system that involve design, engineering, site preparation, foundations, superstructure, mechanical systems, clearing and finishing the structure. Hands - on activities include modeling, developing prototypes, and problem solving using common construction materials and processes.

TECH-413. Introduction to Manufacturing Systems **Credit 3(1-4)**

A study of manufacturing organization, product design, and production systems. Students will be involved in the design, organization, operation and evaluations of classroom manufacturing systems. The course is an essential component of technology education teacher preparation.

TECH-414. Introduction to Communication Systems **Credit 3(1-4)**

Study of communication systems model and its application in sending and receiving messages. Study and laboratory experience in planning and producing graphic and electronics generated messages to individual and mass audiences.

TECH-415. Introduction to Transportation Systems **Credit 3(1-4)**

An introduction to significance of the evolution of transportation and transportation systems on human and societal development. An analysis of the roles of land, air, water, space, and energy systems on rural, urban, and suburban lifestyles. Hands-on activities include the development of models and prototypes of different modes of transportation and transportation systems.

TECH-416. Construction Processes I **Credit 3(1-4)**

Students begin their study with the process of structure design, site clearance, and building excavation. Student teams build scaled structures representing actual commercial, residential, institutional, and civil construction projects. Other activities include servicing requirements, such as altering, repairing, and maintaining structures, reading engineering and construction drawings, the nature of “take off” lists of required materials, construction scheduling, and cost accounting. Prerequisite TECH 412.

GCS-430. Technical Illustration and Design **Credit 3(1-5)**

Principles of graphic design, including design process, color, type and art components. Advanced techniques in computer application and design software.

GCS-433. Industrial Design I **Credit 3(3-0)**

The history of industrial design, contemporary design applications, the design process, and materials are covered. Production techniques are explored as well as the processes of cutting, forming, fastening, and finishing.

GCS-434. Advanced Architectural Drafting **Credit 3(1-4)**

This course deals with the planning of industrial, commercial and public buildings. Topics include: Construction and design principles, materials specifications and codes; complete plans (plot, landscaping, framing, electrical and mechanical equipment), details (reinforced concrete, timber and steel), advanced perspective rendering, analytical study of historical and contemporary architecture, materials and methods, and engineering. Prerequisite: GCS 334.

GCS-435. Architectural Design and Modeling **Credit 3(2-2)**

Planning and structural design problems of buildings and their relationship to other buildings and space are emphasized. Urban and rural planning are studied. Landscape and townscape projects are carried to working detail with emphasis placed on techniques of model construction. Prerequisite: GCS 234.

TECH-462. Organization and Management of Technology Education **Credit 3(3-0)**

Study of organization systems impacting technology education - state, local, school district, community, professional. Classroom organization-curriculum, physical facilities. Classroom management including safety and liability. Personnel management and record keeping.

TECH-463. Career Guidance & Occupational Information **Credit 3(3-0)**

Principles and techniques of guidance and counseling in junior and senior high schools. With emphasis on the study of industrial occupations and guidance as it relates to industrial education classes.

TECH-465. Instructional Analysis Techniques **Credit 3(3-0)**

Analysis of industrial activities and educational goals; identification of technical, occupational, consumer and recreational need of pupils; delineation of curriculum content and instructional materials. Prerequisite: TECH 463.

TECH-510. Research and Development in Technological Systems **Credit 4(2-4)**

Research and development in Technological Systems is the capstone technology education course. This course is a synthesis course where the student researches problems relative to any of the four identified technological systems (i.e., Communication, Transportation, Construction, Manufacturing) and develop solution(s) to the identified problems. The student also will explore the interrelationship among the four technological systems.

GCS-533. Machine Design & Drafting **Credit 3(1-4)**

Lecture and laboratory work includes advanced machine drawings; dimensions, tolerance of fasteners, analysis of motion and motion diagrams. This course includes welding and numerical control, bearings, couplings, gears, jigs and fixtures, and die design. Fundamentals of computer aided design are included. Prerequisite: GCS 234.

GCS-534. Cartographic Drafting and Design **Credit 3(1-4)**

This course includes an introduction to design and drafting related to the fields of surveying and cartography. Topics include: Topographical maps, contours, plat and plot layouts, and surveying and mapping notations. All work will be drawn using a computer aided design system. Prerequisite: GCS 234.

GCS-536. Tool and Machine Design **Credit 3(1-4)**

Fundamentals of tool design, cutting tools, punches and die design, gage design, jigs and fixtures, indexing and coding procedures are emphasized. Design, assembly and detail drawings of machines, tools and parts are studied. Prerequisite: GCS 234.

TECH-566. Technology Education Teaching Methods **Credit 3(3-0)**

Technology Education methodology: Lesson planning, group and individual teaching technique, media development and use, testing and evaluating outcomes in technology courses. Prerequisites: TECH 218, 263, 462, 465, and 510.

GCS-575. Principles of Ink Technology **Credit 3(3-0)**

Study of ink and ink manufacturing technology. Theory and principles of ink properties and applications in the graphic industry will be studied.

GCS-580. Principles of Paper Technology **Credit 3(3-0)**

Study of paper and paper manufacturing technology. Theory and principles of paper properties and applications in the graphic communications industry will be studied.

GCS-585. Graphic Communications Production Management **Credit 3(3-0)**

This course will acquaint the student with production systems management in graphic communications. Human and technical aspects of project management will be studied. Comparison of small and large graphic communications production will be studied. Prerequisite: GCS 130.

GCS-590. Estimating in Graphic Communications **Credit 3(3-0)**

Cost estimating in Graphic Communications identifies components of imaging and printing technologies that constitute a manufactured product in the graphic industry. Variable within each of the components will be explored. Appropriate mathematical formulas will be introduced for pricing out production projects to improve cost controls, production techniques, and to insure company profitability. Prerequisites: GCS 130, 575 and 580.

Advanced Undergraduate and Graduate

GCS-610. Internship in Industry I **Credit 3(0-7)**

Students participate in an industrial setting during a semester in their major field of interest. He/she will be evaluated during the internship through a field diary of events and experiences. Three semester hours is the maximum to be earned during semester.

GCS-611. Internship in Industry II **Credit 3(0-7)**

Students participate in an industrial setting during a semester in their major field of interest. He/she will be evaluated on reports from industry and a field diary of events and experiences, three semester hours is the maximum to be earned during a semester.

GCS-616. Electronics Imaging in Graphic Communications **Credit 3(2-2)**

Theory, principles and practices of electronic non-impact printing are investigated in class. Students will be given opportunities to explain, visit and utilize current non-impact printing systems through visits to industrial settings, classroom projects and special demonstrations.

TECH-617. General Crafts **Credit 3(2-2)**

Principles and techniques of crafts used in school activity programs. Emphasis on materials, tools, and processes used in elementary schools and industrial arts courses. Open to all persons interested in craft instruction for professional or non-professional use.

TECH-618. Vocational Education for Special Needs Students **Credit 3(3-0)**

Opportunities provided for vocational teachers, counselors, and administrators to improve skills in working with disadvantaged/handicapped learners. Emphasis on motivational and creative instructional strategies, discipline drug abuse, module development.

TECH-619. Curriculum Laboratory in Construction Technology Education **Credit 3(2-2)**

Construction Technology Laboratory encompassing rationale, strategies, techniques, and media of teaching in the construction field. Specific teaching methods and curriculum approaches will be studied and explored. Secondary, post-secondary, and industrial settings will be studied.

TECH-620. Curriculum Laboratory in Manufacturing**Technology Education****Credit 3(2-2)**

Manufacturing Technology Laboratory encompassing rationale, strategies, techniques, and media of teaching in the manufacturing field. Specific teaching methods and curriculum approaches will be studied and explored. Secondary, post-secondary, and industrial settings will be studied.

GCS-630. Photography and Educational Media**Credit 3(2-2)**

Principles of composition reproduction and editing are studied. Historical evolution and future trends in photographic applications for educational and technical support are investigated. Theory and technical experiences in traditional electronic and computer-based photographic methods will be explored in a laboratory setting.

GCS-631. Advanced Computer Aided Design**Credit 3(2-2)**

Emphasis of the course will be utilization of "VERSACAD" standards, conventions, devices, and experimentation in advance drafting and design practices using computer aided drafting software. Use of literature and research expected. For teachers with undergraduate preparation or trade experience.

GCS-635. Advanced Principles of Graphic**Communications Technology****Credit 3(2-2)**

Advanced principles in graphic reproduction are analyzed. Study of color applications, photographic applications, design and pre-press techniques are studied in a laboratory setting. Technical experiences in reproduction methods and quality control are investigated in laboratory based projects.

TECH-660. Industrial Cooperative Programs**Credit 3(3-0)**

For prospective teachers of vocational education. Principles, organization and administration of industrial cooperative education.

TECH-661. Organization of Related Study Materials**Credit 3(3-0)**

Principles of scheduling and planning pupil's course and work experience; selecting and organizing related instructional materials in I.C.T. Prerequisite: TECH 660.

TECH-662. Industrial Course Construction**Credit 3(3-0)**

Selecting, organizing and integrating objectives, content, media and materials appropriate to industrial courses. Strategies and techniques of designing and implementing group and individual teaching-learning activities to develop student interest awareness or specialization. Prerequisites: TECH 462, 463, and 465.

TECH-663. History and Philosophy of Technological Education**Credit 3(3-0)**

Chronological and philosophical development of vocational education with special emphasis on its growth and function in American schools.

TECH-664. Occupational Exploration for Middle Grades**Credit 3(3-0)**

Designed for persons who teach or plan to teach middle grades occupational exploration programs. Emphasis will be placed on occupational exploration in the curriculum, sources and uses of occupational information, approaches to middle grades teaching, and philosophy and concepts of occupational education.

TECH-665. Middle Grades Industrial Laboratory**Credit 3(3-0)**

Course organization, teaching strategies, resources and facilities for teaching industrial-technological career exploration in Middle Grades are stressed. Emphasis is on occupational clusters in manufacturing, construction, communication, transportation, fine arts, and public service.

TECH-666. Curriculum Modification for Vocational Education**Special Needs Personnel****Credit 3(3-0)**

For vocational teachers, administrators, and others interested in program modifications for disadvantaged handicapped learners. Emphasis on curriculum adaptations, instructional planning, teaching strategies, media development, and performance assessment for special needs youth.

TECH-668. Independent Studies in Industrial Education**Credit 3(3-0)**

Intensive study in the field of Industrial Education under the direction of a faculty advisor. Prerequisite: Approval of graduate coordinator.

TECH-669. Safety in the Instructional Environment of**Technology Education****Credit 3(3-0)**

Principles and techniques of organizing and supervising safety in a Technology Education setting. Emphasis is placed on instructional strategies, state and national laws, special hazards, color coding, and accident analysis. This course is required for T&I certification by the State of North Carolina.

TECH-670. Introduction to Workplace Training and Development**Credit 3(3-0)**

Overview of the field of training and development. Management concerns related to organizing, operating, and financing training and development programs are discussed. Roles common to practitioners across the broad field of Human Resource Development are covered. Interpersonal perspectives and implications for the future are included.

TECH-671. Methods and Techniques of Workplace**Training and Development****Credit 3(3-0)**

Emphasis on the methods and techniques common to exemplary training programs. Designing learning programs and selecting appropriate media methods and resources using sound theoretical framework is the goal. Evaluation of programs and instruction is discussed.

TECH-672. Curriculum Development Using Microcomputers in**Industrial Education****Credit 3(3-0)**

The focus will be on theory, principles, and concepts of curriculum development as it applies to computers. This course is designed to provide the student with an opportunity to apply the curriculum development concepts to the computer model.

TECH-682. Microcomputer Systems for Industrial Education**Credit 3(3-0)**

The student is introduced to files, diskettes, drives and devices that relate to the microcomputer. Built in and transient utility demands are covered. The MS DOS and Unix systems are introduced with applications to school and research.

DIRECTORY OF FACULTY

Robert B. Pyle, B.A., M.A., Trenton State College; Ph.D., University of Pittsburgh; Professor and Chairperson

Earl Yarbrough, B.A., Wichita State University; M.A., California State University-Los Angeles; Ph.D., Iowa State University; Professor and Dean

Ray Davis, B.S., University of Maryland Eastern Shore; M.S., Ph.D., The Ohio State University; Professor and Assistant Dean

Elazer Barnette, B.S., West Virginia State College; M.S., Ed.D., North Carolina State University; Associate Professor

David Dillon, B.S., M.A., Northwestern State University of Louisiana; M.A., University of Northern Colorado; Ed.D., North Carolina State University; Assistant Professor

Nancy G. Glenz, B.S., Trenton State College; M.S., Ph.D., Michigan State University; Associate Professor

Arjun Kapur, B.S., M.S., Panjab University, India; M.S., McGill University, Canada; Ph.D., Indian Institute of Technology, India; Assistant Professor

Eugenio A. Lord, B.A., Manchester Polytechnic, M.Ed., Bowling Green State University; Ph.D., Iowa State University, Assistant Professor

Jane M. Smink, B.S., Winthrop College; M.A., Appalachian State University; Ed.D., North Carolina State University; Assistant Professor

DEPARTMENT OF CONSTRUCTION MANAGEMENT AND SAFETY

Russell Rankin, Jr., Interim Chairperson

OBJECTIVES

The Department of Construction Management and Safety at North Carolina Agricultural and Technical State University has a two-fold purpose: to prepare men and women to become associated with the scientific, managerial, and supervisory activities of the construction industry and the occupational safety and occupational health professions.

The program in Industrial Technology Construction Management (CM) concentration emphasizes all areas of construction from the viewpoint of the contractor/constructor. This includes all aspects from planning and operations to materials and structures. Students are given instruction in supervision and management, and exposed to the creative problem solving process.

The program in Occupational Safety and Health (OSH) is concerned with the recognition and evaluation of occupational safety and health hazards associated with mechanical systems, material handling, electrical systems, chemical processes, and illustrates controls through engineering revision, safeguarding and personal protective equipment.

DEGREES OFFERED

Industrial Technology - Bachelor of Science

Concentration: Construction Management

Occupational Safety and Health - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program in the Department of Construction Management and Safety is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Students who desire to matriculate in the Department of Construction Management and Safety must have a strong background in math, science and communication skills. Some computer skills are also recommended.

All majors in the department are expected to maintain a minimum grade point average (G.P.A.) of 2.0. A minimum grade of "C" must be earned in all major courses.

Any student transferring to the Department of construction Management and Safety from other disciplines must have a minimum of 2.0.

Industrial Technology Construction Management concentration majors must complete 126 semester hours of University courses. A minimum of 30 semester hours must be com-

pleted in the technical courses for the Industrial Technology Construction Management concentration major.

Students majoring in Occupational Safety and Health must complete a minimum of 126 semester hours of University courses. Included in these 126 semester hours are thirty five semester hours of Occupational Safety and Health courses at the 300 level or above.

ACCREDITATION

The Industrial Technology Construction Management Concentration Program is accredited by the National Association of Industrial Technology.

CAREER OPPORTUNITIES

Graduates of our Industrial Technology Construction Management concentration and safety program are very successful in gaining employment in industrial, governmental, and business as supervisors, managers, engineers, technical salespersons and researchers.

CURRICULUM GUIDE FOR INDUSTRIAL TECHNOLOGY CONSTRUCTION MANAGEMENT CONCENTRATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
CHEM 101/111	4	GCS 234	3
MFG 100	1	CM 190	3
GCS 133	3	ECT 101	3
CM 100	2		16
	<u>17</u>		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 225/235	4	PHYS 226/236	4
GCS 334	3	SOC. SCIENCE ELECTIVE	3
GCS 292	3	ACCT 221	3
SPCH 250	3	CM 216	4
CM 215	4	PHED 200	2
	<u>17</u>		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CM 320	3	ECON 305	3
HUMANITIES ELECTIVE	3	PSYC 445	3
CM 413	3	CM 318	4
CM 317	4	HUMANITIES ELECTIVE	3
SOC. SCIENCE ELECTIVE	3	MFG 300	2
	<u>16</u>		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CM 414	3	CM 412	2
MFG 491	3	CM 410	3
BUAD 422	3	CM 596	3
CM 594	3	FREE ELECTIVE	<u>6</u>
CM 592	<u>3</u>		14
	15		

Total Credit Hours: 126

¹ 3 HRS. - HIST 215, 216, 310, 311, 328, 412 and 416

² 3 HRS. - ENGL 220, 221, 433, 650, 654, and 658

CURRICULUM GUIDE FOR OCCUPATIONAL SAFETY AND HEALTH MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 111	4	MATH 112	4
CHEM 106/116	5	CHEM 107/117	5
GCS 133	<u>3</u>	PHED 200	2
	15	MFG 191	<u>3</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Elective (Human) ¹	3	Elective (Human) ¹	3
PHYS 225/235	4	PHYS 226/236	4
SPCH 250	3	GCS 292	3
CHEM 221/223	5	Elective (Soc. Sci.) ²	3
OSH 311	<u>3</u>	OSH 312	<u>3</u>
	18		16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECON 301	3	BUAD 461	3
Elective (Soc. Sci.) ²	3	BIOL 461	4
OSH 413	3	OSH 414	3
BIOL 160	4	OSH 415	3
BUAD 422	<u>3</u>	OSH 416	<u>3</u>
	16		16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
OSH 411	3	OSH 515	3
OSH 513	3	OSH 516	3
OSH 514	2	OSH 517	3
PSYC 445	3	Electives (Free)	5
SOCI 302	3		14
	<u>14</u>		

Total Credit Hours: 126

¹ 6 HRS. - ENGL 220, 221, 433, 650, 654 and 6582

6 HRS. - HIST 215, 216, 310, 311, 328, 412 and 416

COURSES WITH DESCRIPTION IN THE INDUSTRIAL TECHNOLOGY CONSTRUCTION MANAGEMENT CONCENTRATION DEPARTMENT OF CONSTRUCTION MANAGEMENT AND SAFETY

CM-190. Materials and Processes of Construction **Credit 3(3-0)**

This course will provide comprehensive coverage of construction techniques and materials while following the format of the Construction Specifications Institute. (CSI).

CM-490. Human Relations **Credit 3(3-0)**

A study of problems in the work-a-day world which will aid one in getting along with people on the job, in the community, and the home. These units of work include: habits one may acquire in order to improve human relations, privileges, rights and obligations of a citizen, obtaining and holding a job, labor problems, social and commercial insurance and the use.

CM-497. Co-Operative Training in Industry I **Credit 4**

Students must be in industry full-time for one semester in their major field of work and complete any University Co-Op requirements. They will be evaluated on reports from industry and the University Co-Op Coordinator. The hours earned will be credited toward required technical electives in the Construction Management & Safety Department.

CM 498. Co-Operative Training in Industry II **Credit 4**

The description of this course is the same as CM 497 and is normally the second Co-Op experience of the student.

CM-592. Project Management **Credit 3(3-0)**

An introduction to industrial management with emphasis on planning, organizing, and controlling industrial project development. The course will include materials control and storage, purchasing, quality control, sales and personnel administration.

CM-593. Safety Management **Credit 3(3-0)**

This course focuses on the industrial manager's role in preventing accidents, protecting workers health, and maintaining safety awareness in the workplace.

CM-599. Independent Study **Credit 3(0-6)**

The student selects a technical problem in his major area for special research and study in consultation with a faculty member in his area of interest. He will spend a minimum of 6 hours per week in library research or laboratory experimentation. A technical report in standard format will be required for completion and must be approved by two department faculty members. Prerequisite: Junior or Senior standing.

CM-690. Special Problems in Construction Management**Credit 3(0-6)**

Intensive study in the field of Construction Management under the direction of a faculty advisor.

NOTE: CM 497 or CM 498 may be taken for technical elective credit with approval of advisor.

**Technical Electives in Industrial Technology
Construction Management Concentration****CM-100. Orientation to Construction Management****Credit 2(2-0)**

An introduction to the field of construction management. An overview of construction industry, career opportunities, types of construction, general construction processes, specifications and related technology.

CM-215. Residential Construction**Credit 4(2-4)**

Principles of light frame construction including foundations, framing, exterior finish and related areas of layout; estimating and ordering materials; conventional and modular component systems. Prerequisite: CM 190.

CM-216. Commercial/Industrial Construction**Credit 4(2-4)**

Problems and methods of solution in the construction of commercial buildings; site excavations, foundations, framework, heavy timber, reinforced concrete, structural steel, masonry construction, and related elements. Prerequisite: 215.

CM-217. Construction Estimating**Credit 4(4-0)**

This course is designed to enable the student to gain competency in estimating the amount of materials, time labor, and equipment required to complete construction projects. A practical approach is made of the procedures used in estimating processes to simplify preparation of formal estimates. Prerequisite: MATH 111.

CM-320. Construction Safety**Credit 3(3-0)**

This is a study and evaluation of OSHA standards and regulations as they relate to the construction industry. Safety requirements on various construction operations will be analyzed and discussed. Also, students will learn the principles of safety management, accident prevention, and safety program development methods. Prerequisite: Junior standing.

CM-318. Advanced Construction Estimating**Credit 4(2-4)**

The focus is on the general concepts of computer applications in construction estimating. Special emphasis will involve the utilization of selected commercial computer estimating softwares. Prerequisites: CM 215, 217.

CM-410. Structural Principles**Credit 3(3-0)**

This course focuses on the structural principles in construction. Topics include: shears, virtual work, moments and truss analysis; analysis and design of simple wood, steel and concrete structural members; requirements of current specifications and codes; and with procedures of practical construction. Prerequisite: MFG 491.

CM-412. Mechanical Systems for Building**Credit 2(2-0)**

The basic principles and advanced practices in the selection, installation, operation and maintenance of equipment in the general areas of water supply and sanitation.

CM-413. Principles of Construction Management**Credit 3(3-0)**

Concepts of the construction industry including the contracting, financing, bidding, organizing coordinating and controlling functions and techniques. Junior and Senior standing. Prerequisite: CM 216.

CM-414. Methods in Plane Surveying**Credit 3(1-2)**

A study in determining the positions of points on the earth's surface in relation to each other, including linear and angular measurement in the field. The information thus obtained will be

in such a form that it will be readily used for calculations, written descriptions, plotting maps and profiles-need trigonometry. Prerequisite: MATH 111.

CM-570. Environmental Controls, AC and Heating Systems **Credit 4(2-4)**

A study of principal equipment, design, load calculations for cooling and heating layouts and controls employed in various types of systems. This course is augmented by a practical design problem.

CM-571. Commercial Refrigeration, Heating and Ventilation **Credit 4(2-4)**

A study of steam systems, hot water systems, warm air systems and electrical systems used in heating buildings. Load calculation for walk-in cooler and deep freezer and drinking water fountains. Special refrigerating devices and applications.

CM-594. Construction Planning and Scheduling **Credit 3(1-4)**

The focus on this course is on planning, scheduling and controlling construction projects. Students will define specific activities and work task and prepare work schedules; measure the performance, and evaluate options. Students will learn to develop presentations of accurate and timely information by appropriate computer softwares. Prerequisites: CM 216, 217, 318, 592.

CM-596. Construction Financial Management **Credit 3(3-0)**

This course will provide students with skills in bookkeeping methods and financial analysis for constructors. Factors which impact on contractors' credit image will be discussed along with job management and tax planning. Prerequisite: ACCT 221.

Technical Electives in Occupational Safety and Health

OSH-311. Industrial Accident Prevention **Credit 2(2-0)**

To develop a basic understanding of the principles involved in identifying and eliminating hazards in the workplace to protect the life and safety of employees, including physical, mechanical, electrical, and chemical hazards.

OSH-312. Accident Investigation Analysis and Records **Credit 3(3-0)**

To develop an understanding of the necessity, scope, and requirements of investigation, record/report analysis of accidents to meet federal, state, and local laws and standards. Prerequisite: OSH 311.

OSH-393. Safety Management **Credit 3(3-0)**

This course focuses on the industrial manager's role in preventing accidents, protecting workers' health and maintaining safety awareness in the workplace. Prerequisite: Junior standing.

OSH-411. Hazardous Materials for the Safety Professional **Credit 3(3-0)**

Emphasis is given to liquid and solid substances excluding air contaminants. Lectures include recognition, evaluation, and control of exposures. Given defined exposures, student is required to develop control methods and present them in technical reports.

OSH-413. Industrial Hygiene I **Credit 3(3-0)**

Prerequisites: Chemistry, Physics, and Biology. An introduction to the principles of industrial hygiene and toxicology. Topics include elements of toxicology and occupational disease, airborne contaminants, ionizing and nonionizing radiation, noise and vibration, and heat stress. Emphasis on understanding biological response to and measurement of environment hazards. Application of non-engineering controls with some introduction to the concepts of engineering controls. Laboratory work with industrial hygiene instrumentation.

OSH-414. Principles of Fire Prevention and Protection**Credit 3(3-0)**

An introduction to the basic principles of fire theory, classes of fire, fire prevention, and the necessary measures to minimize the loss of property and the loss of human resources. Prerequisites: OSH Majors and consent of instructor.

OSH-415. Standards and Regulations in Occupational Safety and Health**Credit 3(3-0)**

Develop basic knowledge and understanding of OSH related standards and regulations, be it local, state, or federal. Special emphasis on OSHA, EPA, SARA, CERCLA and WC Standards as they apply to the workplace. Prerequisites: OSH 311, 312.

OSH-416. Industrial Hygiene II**Credit 3(3-0)**

Industrial Hygiene and Toxicology. Application of engineering principles to the control of environmental hazards. Topics include the principles of ventilations and design ventilation, shielding design for radiation protection, methods of noise controls, control of industrial emissions, and disposal of industrial waste. Interrelationship with safety engineering, fire protection engineering, system safety and occupational medicine.

OSH-513. Human Factors**Credit 3(3-0)**

To develop an understanding of the systems so that human tasks and the working environment are compatible with the capabilities and limitation of people. Attention is given to a systems approach in accident prevention and methods of engineering problems for optimum integration of man and machine components.

OSH-514. Industrial Relations**Credit 2(2-0)**

A study of state and federal Workman's Compensation laws; their history, administration and jurisdiction; and their relationship to injury, accidents, and occupational disease.

OSH-515. Evaluation for Occupational Safety and Health**Credit 3(2-2)**

The development of formal technical reports by groups of students functioning as a team to evaluate specific operations, methods, environments, equipments, etc., and to determine significantly important exposures, develop controls, and justify the controls. The course includes performance based field experience. Prerequisites: OSH 413, 416.

OSH-516. Occupational Safety and Health Management**Credit 3(3-0)**

Management techniques applied to Occupational Safety and Health direction of programs, selection, supervision, evaluation of technical personnel, establishing objectives and priorities, intro-company relations, security, and quality performance. Technical reports required. Prerequisites: OSH 311, 312.

OSH-517. Materials Handling for the Safety Professional**Credit 3(3-0)**

Lectures with emphasis on the recognition, evaluation and control of material handling exposures. Design of material handling system, operational analyses, the man-machine-environment relationship in a material handling system and ergonomics are stressed. Case histories are provided and the student is required to write technical reports specifying applicable control methods for assigned case histories.

DIRECTORY OF FACULTY

Walter E. Dukes, B.S., Alcorn Agricultural and Mechanical College; M.S., Indiana State University; Ph.D., Purdue University; Professor

Horlin Carter, Sr., B.A., M.S., Marshall University; Ph.D., Michigan State University; Associate Professor

Dilip T. Shah, B.E., Poona, India; M.S., Illinois State University; Ph.D., Texas A&M University; Associate Professor

Musibau A. Shofoluwe, B.S., NC A&T State University; M.S., Pittsburgh State University; DIT University of Northern Iowa; Associate Professor

Michael D. Taggart, B.S., M.S., M.P.H., Ph.D., University of South Carolina, Assistant Professor

Department of Electronics and Computer Technology

John Spurlin, Chairperson

OBJECTIVES

Students in the Electronics and Computer Technology Department will develop competencies related to the application and utilization of electronics and computers, production processes, principles of distribution and concepts of industrial management and human relations. Students will develop proficiencies in electronics, the physical sciences, communication, mathematics, design, and technical skills to permit the graduate to cope with technical, managerial, and production problems.

DEGREES OFFERED

Electronics Technology - Bachelor of Science

GENERAL PROGRAM REQUIREMENTS

The admission of students to the undergraduate degree program in the Department of Electronics and Computer Technology is based upon the general admission requirements of the University.

DEPARTMENTAL REQUIREMENTS

Electronics Technology majors must complete 126 semester hours of University coursework. A minimum grade of "C" must be earned in all major courses.

Graduates of appropriate associate degree programs may be admitted to the Electronics Technology program as juniors. Specific course requirements for these students will have to be made on an individual basis after their previously earned credits have been assessed. The typical student in this program will be required to take at least 63 additional semester hours.

Any student transferring to the Department of Electronics and Computer Technology from other disciplines must have a minimum of 2.0 G.P.A.

ACCREDITATION

The program is accredited by the National Association of Industrial Technology.

CAREER OPPORTUNITES

Graduates of the Electronics Technology program are very successful in receiving employment in industry and business with positions in technology, management, and technical sales. Typical job titles are Project Manager, Industrial Analyst, Quality Control Specialist, Systems Administrator, Manufacturing Supervisor, Shift Superintendent, Technologist, Engineering Technologist, and Industrial Technologist.

CURRICULUM GUIDE FOR INDUSTRIAL TECHNOLOGY ELECTRONICS CONCENTRATION MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 110	4	GCS 234	3
CHEM 101, 111	4	MFG 191	3
ECT 101	3	MFG 100	1
GCS 133	3	MATH 131	4
	<u>17</u>	PHED 200	<u>2</u>
			16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECT 201	3	ECT 212	3
PHYS 225, 235	4	PHYS 226, 236	4
*MATH 132	4	SPCH 250	3
Soc. Sci. Elective	3	ECT 213	3
ECT 211	3	GCS 292	3
	<u>17</u>		<u>16</u>

* with consent of advisor, students may substitute MATH 123, MATH 224 or ECT 220.

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ECT 312	3	Humanities Elective	3
ACCT 221	3	ECT 314	3
Humanities Elective	3	ECT 350	3
ECT 313	3	ECT 360	3
ECT 355	3	MFG 300	1
	<u>15</u>	Soc. Sci. Elective	<u>3</u>
			16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PSYC 445	3	CM 593	3
Free Elective	3	ECT 599 (Project/Coop)	3
CM 592	3	*Technical Specialization	3
BUAD 422	3	Free Elective	2
*Technical Specialization	3	MFG 495	3
	<u>15</u>		<u>14</u>

Total Credit Hours: 126

* Technical Specialization Courses: See an advisor for the approved list.

NOTE: Military or Air Science may be used as free electives.

COURSES WITH DESCRIPTION IN THE ELECTRONICS & COMPUTER TECHNOLOGY DEPARTMENT

ECT-101. Technical Computers I

Credit 3(2-2)

This course is designed to provide the student with basic computer skills as required in a typical business environment. Emphasis is on various business software packages including: Spreadsheets, database management, word-processing, etc., as run on UNIX, DOS, and Windows platforms. Basic language programming is also covered.

ECT-201. Technical Computers II

Credit 3(2-2)

This course is a continuation of ECT 101. Emphasis is placed on electrical/electronics software packages and techniques including: P-Spice, Micro-Cap, and the Fast Fourier Transform (FFT). Parallel processing is introduced via the T900 transputer. Object oriented programming is introduced through the language of C++. Prerequisite: ECT 101.

ECT-211. Electric Circuits I

Credit 3(2-2)

This course is a study of the fundamentals of direct and alternating electricity. Topics include definitions, fundamental units, Ohms Law and practical applications. Prerequisites: MATH 112.

ECT-212. Electric Circuits II

Credit 3(2-2)

This course is a continuation of Electric Circuits I. Topics include network analysis, power factor correction, complex impedance, polyphase systems, filters, resonance, and simple dynamos. Prerequisite: ECT 211.

ECT-213. Digital Circuits

Credit 3(2-2)

This course deals with digital logic fundamentals. Topics include combinational and sequential circuits and systems. Karnaugh maps and software tools are utilized. Prerequisite: ECT 211.

ECT-220. Electromechanical Systems Analysis

Credit 4(4-0)

This course deals with the fundamentals of electrical and mechanical dynamical systems. Frequency and time domain analysis techniques are utilized. Electrical and mechanical applications of first and second order linear differential and difference equations are examined through transform techniques. Specialized applications software packages are examined. Prerequisites: MATH 112, MFG 293, ECT 211.

ECT-234. Electronic Instrumentation

Credit 3(2-2)

This course is designed to develop basic competencies related to components and circuits used in instrumentation to include basic transistor configurations; voltage regulators; integrated circuit operational amplifiers, amplifier feedback principles and DC to DC converters. Prerequisite: ECT 312.

ECT-312. Active Circuits I

Credit 3(2-2)

This course is an introduction to active electronic circuitry. Topics include: Power supplies, small and large signal amplifiers and linear integrated circuits. Prerequisite: ECT 212.

ECT-313. Electronic Microcomputer Systems I

Credit 3(2-2)

This course addresses the programming and interfacing of 8-bit microcomputer based systems. Prerequisite: ECT 213.

ECT-314. Active Circuits II

Credit 3(2-2)

This course is a continuation of Active Circuits I. Topics include: Oscillators, phase locked loops, current differencing amplifiers, logarithmic amplifiers, transconductance amplifiers, voltage regulators and specialized communications circuits. Prerequisite: ECT 312.

ECT-350. Communications Systems

Credit 3(2-2)

This course investigates the fundamental concepts of electronic communications systems. Topics include: Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation

(PM), digital modulation schemes, principles of power spectra and time domain analysis. Prerequisite: ECT 312.

ECT-355. Electrical Power and Machinery

Credit 3(2-2)

This course addresses the fundamentals of rotating electrical machinery and electrical power generation, transmission and distribution. Prerequisite: ECT 212.

ECT-360. Industrial Measurements & Control

Credit 3(2-2)

This course deals with the basic principles of electronic industrial measurements and control. Topics include: Transducers, final correcting devices, open and closed loop controllers, stability and damping. The student will be required to analyze complex industrial measurement and control systems. Prerequisites: ECT 312, 313.

ECT-413. Electronic Microcomputer Systems II

Credit 3(2-2)

This course is a continuation of ECT 312, with an emphasis on 16/32 bit systems and micro-controllers. Topics include interfacing and programming of microcomputer and microcontroller systems. Prerequisite: ECT 313.

ECT-430. Industrial Electronics

Credit 3(2-2)

A study of components and circuits in control systems to include: thyratons, thermocouples, thermistors, photo conductive cells, photo voltaic cells, waveshaping, and IC circuits. Prerequisite: 312.

ECT-433. Video Electronics

Credit 3(2-2)

A study of telecommunications with emphasis on T.V., microwaves, radar, fiber optics, laser and computer CRT in electronic network systems.

ECT-450. Electronic Signal Transmission Systems

Credit 3(2-2)

This course addresses the principles of electronic signal transmission through various media. Topics include: transmission lines, microwave systems, waveguides, fiber optics, and satellite systems. This course involves an extensive use of Smith Charts. Prerequisite: ECT 350.

ECT-497. Co-Operative Training in Industry I

Credit 4

Students must be in industry full-time for one semester in the major field of work and complete any University Co-Op requirements. The student will be evaluated on reports from industry and the University Co-Op Coordinator. The hours earned will be credited toward required technical electives in the Electronics & Computer Technology Curriculum. Four semester hours credit is the maximum to be earned under this arrangement any one semester. Eight semester hours is the maximum to be earned in the Co-Op arrangement in the Electronics and Computer Technology Department.

ECT-498. Cooperative Training in Industry II

Credit 4

The description of this course is the same as ECT 497 and is normally the second Co-Op experience of the student.

ECT-599. Independent Study

Credit 3(0-6)

The student selects a technical problem in electronics or computer technology for special research and study in consultation with a faculty member in area of interest. The student will spend a minimum of six (6) hours per week in library research or laboratory experimentation. A technical report in standard format is required for completion and approved by faculty. Prerequisite: Junior or senior standing with Department Chair approval.

ECT-610. Data Communications

Credit 3(2-2)

This course investigates the exchange of digital data between terminals and computers. Topics include: Multiplexing, modems, causes and correction of electronic circuit impairments. Analog and digital communication systems are analyzed and contrasted. Prerequisite: ECT 350.

ECT-620. Telecommunications Management**Credit 3(2-2)**

This course addresses fundamental principles of telecommunications management, which includes network management and administration, the telecommunications marketplace, and the planning and evaluation of systems. The technology of modern telecommunications systems is also reviewed. Prerequisite: ECT 350.

ECT-630. Electronic Communications Networks**Credit 3(2-2)**

This course involves an intensive investigation of the principles involved in designing Local Area Networks (LANs), Metropolitan Area Networks (MANs), and Wide Area Networks (WANs). The student will be required to design an appropriate network to meet pre-determined specifications. Prerequisite: ECT 350.

ECT-640. Electronic Automated Testing Systems**Credit 3(2-2)**

This course addresses the fundamentals of electronic automated testing systems. Topics include: Production, reliability, and maintenance testing. Various types of Automated Test Equipment (ATE) are addressed, including Built in Test Equipment (BITE) and stand alone systems. Prerequisite: ECT 360.

ECT-690. Special Problems in Technology**Credit 3(0-6)**

Intensive study in the field of Electronics and Computer Technology under the direction of a faculty advisor.

DIRECTORY OF FACULTY

Thomas Avery, B.S., Hampton Institute; M.S., A&T State University; Assistant Professor
Rajendra Desai, B.S.E.E., Bangalore University, India; M.S.E.E., Texas A&M University; DIT, University of Northern Iowa; Associate Professor

Hank A. Javan, B.S.E.E., California State Univ.; M.S.E.E., Univ. of California, Los Angeles; D.Sc.EE., Washington University; Associate Professor

John Spurlin, B.S.E.E., Cook Institute; M.S.C.E., M.Ed., Ph.D., Wayne State University; Associate Professor and Chairperson

Veeramuthu Rasjaravivarma B.S. EE., M.S.EE., University of Madras; MASC(EE), University of Windsor; Ph.D., Tennessee Technological University; Associate Professor

Hrair Aintablian, B.S.EE., M.S.EE., Ph.D., Ohio University; Assistant Professor

COLLEGE OF ENGINEERING

Kenneth Murray, Interim Dean
Lonnie Sharpe, Jr., Associate Dean
John Kelly, Associate Dean

OBJECTIVES

The College grants bachelor of science degrees in agricultural, architectural, chemical, civil, electrical, industrial, and mechanical engineering and computer science. The College also offers the master of science degrees in engineering, architectural engineering, electrical engineering, industrial engineering, mechanical engineering, and computer science. The Ph.D. degree is offered in electrical and mechanical engineering and is available in most other engineering disciplines through an interinstitutional program between North Carolina State University and NC A&T State University.

The programs of study are aimed at preparing a student for engineering practice in all phases of his or her chosen field.

The specific objectives of the College of Engineering are:

1. To prepare the student for an active career in his/her chosen discipline within the profession.
2. To provide a comprehensive background in all phases of the engineering design process, namely: conception, planning, synthesis, analysis, design, and management.
3. To provide a basic knowledge of the mathematical and natural sciences upon which the practice of engineering and computer science depend.
4. To develop the judgment the engineer or computer scientist requires to utilize effectively, and economically, for the benefit of mankind.
5. To encourage the student to develop an appreciation for the process of continuing education.
6. To develop the intellectual, professional, and social characteristics of the student in such a manner as to enable him/her to become a responsible leader in the community.

ADMISSION, MATRICULATION, AND PROGRESSION POLICIES

I. Admission Policy

For admission to any engineering program or the computer science program, the applicant must satisfy the standing University admissions policy. In addition, the applicant must have completed Algebra I and II, one unit of geometry and one advanced mathematics course*.

**Students entering with a deficiency in mathematics or who score low on the Mathematics Placement Examination must begin with Pre-Engineering Mathematics which is not counted towards the required semester hours for graduation. In this case the normal mathematics sequence is shifted one semester.*

II. Matriculation Policy

1. All engineering and computer science students must meet certain prerequisites prior to beginning sophomore level departmental courses required in their chosen major. They must:
 - a. Attain a grade of "C" or better in Math 131.

- b. Attain a grade of "C" or better in English 100 and English 101.
 - c. Attain a grade of "C" or better in each of the appropriate freshman departmental courses.
2. Students not meeting requirements for sophomore departmental course eligibility shall be given individual counseling in selecting one of the following options:
 - a. Change major.
 - b. Continue in current status, with a reduced number of credit hours per semester, and/or repeat key courses in math, freshman engineering, or computer science etc., before beginning sophomore departmental courses.
 - c. Change major department within the College of Engineering and continue to attempt to fulfill sophomore departmental course eligibility.
3. Individual advice and counseling for students deficient after the freshman year shall be provided by the student's host department.

COOPERATIVE EDUCATION PROGRAM

A cooperative education program, in which students may earn a major portion of their educational expenses through a work-study arrangement with industry, is available to students with satisfactory scholastic records.

After satisfactory completion of at least two semesters, students in engineering and computer science may alternate semesters in industry with semesters at the University until graduation. This arrangement enables the student to receive two years of work experience while completing a degree.

REQUIRED SENIOR EXAMINATION

In concert with our faculty's wish to improve the quality of education for our graduates, a senior examination was established in September 1980; it became a graduation requirement in February 1982. An engineering student should take the senior examination during the first semester of the senior year.

The examination is given each fall semester for May or summer graduates. It is also given each spring semester for students completing graduation requirements in December. Usual examination dates are: for the fall test, a Saturday in late October, and for the spring test, a Saturday in early to mid-April. The test date will be posted and announced early each semester. After each examination, a list of attendees will be transmitted to the University Registrar for inclusion in student files.

Specifically, the senior examination is expected to complement the current educational experiences of our graduates and to help the College monitor its program quality. It will provide each student with a preview of the type of objective test that must be passed by those wishing to become registered engineers by taking the Engineering or Fundamentals Examination (FE). The senior examination results will provide the department chairpersons with key data in determining areas of the curricula in which change is warranted.

GENERAL ENGINEERING Undergraduate

GEEN-100. Introduction to Engineering

Credit 2(2-0)

This course gives an overview of the engineering profession. The topics include: career opportunities, professional ethics and registration, public and personal safety, the engineering

method, written and oral communication, units and dimensions representing technical information aspects of engineering design, use of micro-computers for word processing, plotting and spreadsheets.

GEEN-101. Introduction to Engineering Graphics

Credit 2(0-4)

An introductory engineering graphics course covering the following topics: fundamentals of engineering graphics, principles of orthogonal projection, sketching for technical design, dimensioning, sectional and auxiliary views, oblique and isometric drawing, surface intersection and developments, and computer graphics. Corequisite: GEEN 100.

GEEN-102. Computer Programming for Engineers

Credit 2(1-2)

Introduction to computers and computer programming for engineers; operating systems, flow charting, programming in FORTRAN and BASIC, using computers to solve engineering problems. Prerequisite: GEEN 100.

GEEN-601. Industrial Automation

Credit 3(2-2)

Automation and market competitiveness, sensors and measurements, circuit board design, materials handling systems production control, and Computer-Integrated Manufacturing Systems. Laboratory experimentation in selected modern manufacturing technologies. (Senior standing and EE 410 for EE Majors)

GEEN-602. Advanced Manufacturing Laboratory. GEEN-601.

Credit 3(0-6)

Students will work in inter-disciplinary teams to design and manufacture products based on the concepts acquired in GEEN 601 — Industrial Automation.

Agricultural and Environmental Systems Engineering

Godfrey Gayle, Coordinator

The agricultural and environmental systems engineering program is jointly administered by the School of Agriculture and the College of Engineering.

OBJECTIVES

The primary objective of the Agricultural Engineering and Environmental Systems Program is to meet its responsibility to society by training professional agricultural engineers who can identify, analyze and solve present and future complex agricultural engineering problems.

The agricultural engineer is trained to have an understanding of biological sciences along with the conventional strength of engineers in math, physics, and chemistry. These unique engineers have the capability to utilize both biological and engineering design parameters to develop systems which are commercially feasible and economically viable. Agricultural engineers serve as a bridge to unite the biological and engineering fields.

The program is comprised of a core curriculum with upper level specialization covering water resources engineering, soil and water conservation engineering, natural resource management, and biological and agricultural energy systems.

Courses in the second semester of the junior year and throughout the senior year provide the bulk of the design content.

The program provides an undergraduate education which will prepare students to be competent and productive in the field of Agricultural Engineering. Students are also trained to pursue graduate studies in any specialized engineering field.

DEGREES OFFERED

Agricultural and Environmental Systems Engineering - Bachelor of Science

DEPARTMENTAL REQUIREMENTS

The Agricultural Engineering major must complete 127 credit hours, following the approved curriculum. Students majoring in this discipline must maintain a 2.00 cumulative grade point average. See program handbook for additional requirements.

ACCREDITATION

The undergraduate program in agricultural and environmental systems engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC-ABET). This makes the university the first historically black college or university to offer an accredited undergraduate program in this engineering discipline.

CAREER OPPORTUNITIES

A degree in this field prepares a student for careers in Engineering Design, Management, Research, Consulting, Governmental Agencies, Industries, Foreign Services, Sales, Teaching, and Product Development.

CURRICULUM GUIDE FOR AGRICULTURAL AND ENVIRONMENTAL SYSTEMS ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	MATH 132	4
HIST 100	3	PHYS 241	3
ENGL 100	3	PHYS 251	1
GEEN 100	2	CHEM 101	3
GEEN 101	2	CHEM 111	1
PHED Elective	2	GEEN 102	2
	<u>16</u>	ENGL 101	<u>3</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 331	3
PHYS 242	3	MEEN 337	3
PHYS 252	1	EASC 309	3
Hist. Elective	3	BIOL 221/220	4
MEEN 335	3	AGEN 401	<u>3</u>
Soc. Sci. Elective	<u>3</u>		16
	17		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 336	3	AGEN 303	3
ELEN 200	3	ECON300/ECON 301	3
ELEN 206	1	MEEN 441	3
AGEN 410/CIEN 360	3	AGEN 430	4
CIEN 362/MEEN 416	3	ENGL 200	3
MEEN 426/CIEN 363	1		16
	<u>14</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AGEN 304	3	AGEN 523	3
Humanities Elective	3	AGEN 624/CIEN 560	3
AGEN 600	3	INEN 260	2
EASC 622/CIEN 610	3	AGEN 602	3
ECON 305	3	SLSC 632	4
	<u>15</u>	AGEN 520	1
			16

Total Credit Hours: 127

AGRICULTURAL AND ENVIRONMENT SYSTEMS ENGINEERING

AGEN-113. Agricultural Drawing

Credit 3(0-6)

Lettering, use of instruments, projection drawing, auxiliaries, dimensioning, isometric drawing, working drawings - structural, and graphics (charts and graphs).

AGEN-114. Home and Farm Maintenance

Credit 3(1-4)

Selection, sharpening, care and correct use of shop tools and equipment; woodworking and simple carpentry; simple electrical repairs; sheet metal work; electric arc and oxyacetylene welding; pipe fitting and simple plumbing repairs.

AGEN-303. Power and Machinery

Credit 3(2-2)

This course deals with tractive units which include field machinery and tractor power. The first part involves the design principles of field machinery, evaluating the functional performance, and the efficiency of these machines. The second part deals with the thermal analysis of internal combustion engines. Students will learn to measure and calculate tractive and engine powers. Prerequisites: MEEN 336, 337.

AGEN-304. Structures and Environment

Credit 3(1-4)

This course deals with the fundamentals of building construction applied to location, selection materials, foundations, planning farm structures, and environmental considerations such as temperature, humidity, condensation, and ventilation.

AGEN-401. Surveying, Practices and Principles

Credit 3(2-2)

An introduction to plane surveying. Topics include: use of surveying instruments, theory of measurements and sources of error, traverse and curve computations, stadia measurements, differential and profile leveling, topographic mapping and design projects.

AGEN-402. Farm Power

Credit 3(1-4)

Principles of mechanical power, use, care and adjustment of internal combustion engines. Prerequisites: PHYS 241, 251.

AGEN-410. General Hydrology**Credit 3(2-2)**

An introduction to the study of surface and subsurface hydrology. Topics include: hydrologic cycle, rainfall-runoff relationships, precipitation measurements and hydrographs, unit hydrograph analysis, flood routing, planning and design of runoff/detention systems, computer applications in hydrology.

AGEN-430. Agricultural Systems Analysis and Design**Credit 4(2-4)**

System-based thinking will be used to improve the students integrative view in Agricultural Engineering designs. This concept will be used in designing physical models for real world application. Subject matter discussions will include: soft and hard systems, learning styles, defining the problem, relevant systems, design techniques, optimum designs and evaluation. Prerequisites: MEEN 336, GEEN 102, and ECON 300 or 301.

AGEN-520. Senior Seminar**Credit 1(0-3)**

This is a seminar in Agricultural and Environmental Systems Engineering that will provide an opportunity for senior students to make presentations on their research or design projects.

AGEN-522. Dairy/Food Engineering**Credit 3(2-2)**

The general engineering principles of solids, fluids, and process equipment will be discussed. Topics include energy, heat, enthalpy, psychometrics, heat and mass transfer, drying and refrigeration of food products. Prerequisite: MEEN 441, or consent of the instructor.

AGEN-523. Biological and Agricultural Energy Systems**Credit 3(2-2)**

This course discusses the production, utilization, and system design for energy in food and agricultural productions. Specific topics include: biogas, biomass, solar energy, drying, energy analysis, conservation and management, including electric power supply and motor control. Prerequisites: ELEN 200, 206.

AGEN-525. Farm Shop Organization and Management**Credit 3(1-4)**

A course designed for prospective and in-service teachers of vocational agriculture; includes presentation of purpose, plans and equipment of shops, organization of course of study and methods of teaching. Prerequisites: AGEN 114; AGED 501.

Advanced Undergraduate and Graduate**AGEN-600. Soil and Water Engineering I****Credit 3(2-2)**

Improvement of soil and water use by evaluating and using present conservation practices. Water conveying and retaining structures, and soil conservation, drainage and irrigation systems will be discussed and designed. Prerequisites: CIEN 362 and 363, AGEN 410 and 430.

AGEN-601. Advanced Farm Shop**Credit 3(1-4)**

Study of the care, operation, and maintenance of farm shop power equipment. Prerequisite: AGEN 114.

AGEN-602. Agricultural Engineering Design**Credit 3(0-6)**

Special design work in Agricultural Engineering. The major objective is to enhance the design skills of the Agricultural Engineering students. Prerequisites: AGEN 600, AGEN 624 as corequisite.

AGEN-619. Instrumentation and Measurement**Credit 3(2-2)**

This course will emphasize quantitative evaluation of some of the well established parameters such as: temperature, humidity, fluid flow, pressure, displacement, velocity, acceleration, force, stress, strain, etc. that are widely used in the area of Agricultural Engineering. Prerequisites: PHYS 241, MEEN 336.

AGEN-624. Water Resources Engineering

Credit 3(2-2)

Analysis and design of water resources systems. Topics include: water resources planning, hydraulic structures, introduction to aquifer analysis, well development, pump selection, water quality and management, water laws, and detention and retention ponds. Prerequisite: AGEN 410.

DIRECTORY OF FACULTY Agricultural Engineering

Peggy Fersner, B.S., Virginia Polytechnic Institute; M.S., Clemson University; Lecturer
Godfrey A. Gayle, B.S., North Carolina A & T State University; M.S., Ph.D., N.C. State University at Raleigh; Professor, Coordinator of Agricultural Engineering Program

Richard Phillips, B.S., Iowa State University, M.S., N.C. State University; P.E. for North Carolina; Adjunct Associate Professor

Manuel R. Reyes, B.S., M.S., University of the Philippines at Los Banos; M.Phil., Cranfield Institute of Technology, England, Ph.D., Louisiana State University; Assistant Professor
Abolghasem Shahbazi, B.S., University of Tabriz; M.S., University of California, Ph.D., Pennsylvania State University; Associate Professor

Joan White, B.S., North Eastern University-Boston; M.S., Tufts University; Adjunct Assistant Professor

Department of Architectural Engineering

Ronald N. Helms, Chairperson

OBJECTIVES

It is the aim of the program in architectural engineering to encourage and develop students, who exhibit creative ability and who exhibit the ability to grasp and use scientific principles, for professional careers in the art and science of engineered systems building design. Strong emphasis is placed on training in the building sciences and on training in engineering as it applies to the engineering design and construction of buildings. Training provided through exposure and involvement with research projects and investigations directed by the architectural engineering faculty is encouraged.

The architectural engineering program provides considerable training in general education which is devoted to study of social and physical sciences, art, English, mathematics and the humanities. Introductory courses in engineering and a large percentage of the required general education courses are scheduled in the freshman and sophomore years. This training, during the first and second years, provides background for the study of basic engineering science and the study of more professional courses which are scheduled later in this program. Instruction within the department of architectural engineering is organized under four divisions.

1. Structures
2. Energy and Building Environmental Systems: Electrical/Lighting and Building Mechanical Systems
3. Management, Facilities Engineering
4. Design

Each of these divisions has specific course requirements that are aimed toward the development of the architectural engineering student, so that a graduate will be able to take a place in society as a professional in the field of engineering.

The four year program in architectural engineering leads to the bachelor of science degree.

DEGREES OFFERED

Architectural Engineering - Bachelor of Science

*Architectural Engineering - Master of Science

*Engineering - Master of Science

**See the Graduate School Bulletin*

DEPARTMENT DEGREE REQUIREMENTS

See College of Engineering Undergraduate Admission policy statement. For Graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENTAL REQUIREMENTS

The major in architectural engineering must complete 128 semester hours of University courses. Included in the 128 semester hours are 9 semester hours of architectural engineering courses selected from one of four optional blocks - Structures; Energy and Building Environmental Systems, Facilities Engineering; and Design**.

**** *To be eligible to enroll in Advanced Design Courses, a student must (a) have an accumulated GPA of 2.65 for unconditional enrollment, (2) have completed all prerequisites, and (3) be of senior standing. A student, with a GPA below 2.65, may petition the departmental design committee for permission to enroll in Design III. The petition must be reviewed by the design committee and approved by the department before the student will be allowed to enroll in Design III.***

ACCREDITATION

The undergraduate program in architectural engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. It is not an accredited Architecture Program.

CAREER OPPORTUNITIES

Completion of the architectural engineering program provides training for a career in the profession of engineering as related to the engineering design and construction of building systems. Training in architectural engineering prepares graduates to pursue a goal of professional practice or business. Graduates are employed in offices of professional engineers engaged in building systems design which include the design of structural, mechanical and electrical systems for buildings. Graduates are employed as engineers in the offices of professionals engaged in engineering systems design for architectural projects. Architectural engineering graduates have an opportunity for a career with construction firms and building materials manufacturers where there exist various positions that utilize architectural engineering training.

CURRICULUM GUIDE FOR ARCHITECTURAL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEEN 100	2	GEEN 102	2
GEEN 101	2	MATH 132	4
MATH 131	4	ENGL 101	3
ENGL 100	3	PHYS 241	3
AREN 112	3	PHYS 251	1
African-Amer. Studies	3	Global Studies	3
	<u>17</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 331	3
MEEN 335	3	MEEN 336	3
PHYS 242	3	CHEM 101	3
AREN 231	3	CHEM 111	1
Humanities or Soc. Science Elect.	3	MEEN 337	3
	<u>16</u>	AREN 221	3
			<u>16</u>

Junior Year

Lower Junior

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AREN 331	3	AREN 332	3
AREN 325	3	AREN 470	3
AREN 326	1	AREN 461	3
AREN 342	3	AREN 352	3
MEEN 441	3	MEEN 416	3
MATH Elective	3	EASC 309	3
	<u>16</u>		<u>18</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
AREN 521	1	AREN 242	3
AREN 512	3	AREN	3
AREN 462	3	ECON 301	3
INEN 260	2	Humanities or Soc. Science Elec.	3
AREN Option Block	3	Health/P.E.	2
AREN Option Block	3		14
	<u>15</u>		

Total Credit Hours: 128

OPTIONAL BLOCK

STRUCTURES

Dept.	No.	Course	Credit
AREN	602	Advanced Struct. Analysis	3
AREN	471	Steel Structures I	3
AREN	472	Steel Structures II	3
AREN	481	Reinforced Concrete	3
AREN	601	Advanced Concrete	3
AREN	603	Foundation Engr.	3

ENERGY & BUILDING ENVIRONMENTAL SYSTEMS

Dept.	No.	Course	Credit
AREN	610	Energy and the Environment	3
AREN	611	Energy Conservation in Bldgs.	3
AREN	612	HVAC System Design	3
AREN	642	Lighting Applications	3
AREN	666	Electrical Systems II	3

FACILITIES ENGINEERING

Dept.	No.	Course	Credit
AREN	610	Energy and the Environment	3
AREN	611	Energy Conservation in Bldgs.	3
AREN	624	Facilities Management	3

DESIGN**

Dept.	No.	Course	Credit
AREN	431	Arch Design III	3
AREN	620	Arch Design IV	3
AREN	621	Adv. Architect Design	3
AREN	622	City & Urban Design	3

**** To be eligible to enroll in Advanced Design Courses, a student must (1) have an accumulated GPA of 2.65 for unconditional enrollment, (2) have completed all prerequisites, and (3) be of senior standing. A student, with a GPA below 2.65 may petition the departmental design committee for permission to enroll in Design III. The petition must be reviewed by the design committee and approved by the department before the student will be allowed to enroll in Design III.**

COURSES WITH DESCRIPTION IN ARCHITECTURAL ENGINEERING Undergraduate

AREN-112. History of American Literature **Credit 3(3-0)**
History of American Architecture is an illustrated lecture course. This course provides an analytical study of the major architectural and engineering developments that have shaped the American-built environment from the arrival of the Europeans to the present.

- AREN-221. Building Sanitation and Fire Protection** **Credit 3(3-0)**
Lecture-problem course. Waste water treatment, water supply and distribution. Plumbing systems and fixtures; soil, water and venting systems. Pipe sizing fire protection systems for buildings. Pumps, sprinklers, gravity and pressure vessels, and controls.
- AREN-231. Materials and Methods of Construction** **Credit 3(3-0)**
This course will introduce the student to the use of construction materials in buildings. An evaluation of both the function and form of the major building systems such as walls, floors and roofs will be presented. Formerly AREN 132 and AREN 232.
- AREN-242. Production Drawings** **Credit 3(0-6)**
Laboratory course: Design development drawings and architectural working drawings Production of small scale general drawings include plans and elevations, large scale detail drawings and schedules. Prerequisite: Senior Standing.
- AREN-325. Structural Analysis** **Credit 3(3-0)**
This course introduces the concepts of structural analysis for determinate and indeterminate structural systems using both hand calculations and computer applications. Formerly AREN 321 and AREN 322.
- AREN-326. Structural Engineering Laboratory** **Credit 1(0-2)**
This laboratory course will introduce the student to laboratory methods in experimental structural analysis and use demonstration experiments to reinforce structural concepts from AREN 325. Computer applications will also be used as required to illustrate structural behavior.
- AREN-331. Architectural Design I** **Credit 3(0-6)**
Introduction to the basic fundamentals of design: space relationships, form and visible structure. Perspective drawing; plans, elevations and sections. Shades and shadows. Prerequisite: AREN 122 or permission of instructor.
- AREN-332. Architectural Design II** **Credit 3(0-6)**
Laboratory-lecture course. Presenting a series of problems in space organization and planning with the study of composition and structure. Prerequisite: AREN 331.
- AREN-342. Building Illumination Concepts** **Credit 3(1-2)**
A study of the basic principles of illumination, lighting concepts, analysis, design, and the application of these principles to luminous environments. Topics include physics of light, vision, and visibility, units and terminology, light sources, numerical methods and the application of these principles to lighting design. Prerequisite: PHYS 242.
- AREN-352. Electrical Systems for Buildings** **Credit 3(2-2)**
This course covers the analysis and design of electrical systems utilizing the National Electrical Code. The topics include a review of basic circuits, single phase and three phase power, branch circuits, panel boards, motors and electrical distribution in buildings. The course also includes design topics of system sizing, over current protection, voltage drop, and harmonics as they apply to electrical building systems design.
- AREN-431. Architectural Design III** **Credit 3(0-6)**
Laboratory-lecture course presenting a series of problems for study of space analysis, space organization, form and function. Integration of architectural and structural components. Introduction to computer-aided drafting and design. Prerequisite: AREN 332.
- AREN-461. Heating, Ventilating and Air Conditioning Principles** **Credit 3(2-2)**
Concepts of energy and building design. Psychometrics, and human comfort. Design heat transfer functions, heating loads, cooling loads and the refrigeration cycle. Prerequisites: MATH 132 and PHYC 242.

AREN-462. Heating Ventilating and Air Conditioning Systems **Credit 3(2-2)**

Heating, ventilating and air conditioning central system components. All water-water systems, packaged systems. Introduction to air-side and waterside system design concepts. Space air diffusion and energy recovery systems. Prerequisite: AREN 461.

AREN-470. Structural Engineering Design **Credit 3(3-0)**

This course will introduce the student to the design of steel, timber and reinforced concrete structures. Consideration will be given to simple structural systems as designed for each material.

AREN-471. Steel Structures I **Credit 3(2-2)**

Theory and design of structural components: tension members, compression members and beams. Connections design of statically determinate systems. Design of structural systems for multi-story buildings using bracing connection. Determination of wind, snow and earthquake loads. Prerequisite: AREN 321.

AREN-481. Reinforced Concrete Theory and Design **Credit 3(3-0)**

Reinforced concrete theory as applied to building structures. Design of beams, slabs, and columns. Prerequisites: MEEN 335 and MEEN 336.

AREN-512. Senior Project **Credit 3(0-4)**

Preparation of final construction documents including calculations, drawings final construction cost estimate and specifications. Prerequisite: Senior standing.

AREN-521. Senior Seminar **Credit 1(1-0)**

Preparation of resumes, interviewing techniques, and career alternatives. Review of material included in the Engineer in Training Exam. Prerequisite: Senior standing.

AREN-522. Professional Practice **Credit 2(2-0)**

Lecture. Procedures of professional practice, registration, ethics, professional services, contracts, bonds, liens, insurance bidding procedures, supervision, and administration of construction operations, office management. Prerequisite: Upper Junior Status. AREN majors only.

AREN-561. Foundation and Soil Structures **Credit 3(1-4)**

Lecture and laboratory. Origin and composition of soils structure. Flow of water through soils, capillary and osmotic phenomena. Soil behavior under stress; compressibility; shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes.

AREN-573. Energy Management for Building **Credit 3(3-0)**

Lecture problems course: Study of renewable and nonrenewable energy sources for buildings, energy estimating methods (manual and automated) optimizing building envelop design, comparative energy requirements for various HVAC systems. Utilization of the solar energy F-chart method, design of efficient lighting and electrical systems. Energy management and control systems (EMCS) waste heat recovery, energy audit procedures for existing buildings, life cycle cost and techniques.

Advanced Undergraduate Courses

AREN-601. Advanced Reinforced Concrete **Credit 3(3-0)**

Design and analysis of columns for axial loads, and biaxial bending. One way and two way slabs, multi-story building frames, continuous beams, precast joists, footings, retaining walls and prestressed and post tension beam design.

AREN-602. Advanced Structural Analysis **Credit 3(3-0)**

This course emphasize the more complex concepts of structural analysis for determinate and indeterminate structural systems using both hand calculations and computer applications.

AREN-603. Foundation Engineering**Credit 3(3-0)**

Subsoil investigations analysis and design of foundations and other substructures. Caisson and cofferdam design and methods of construction ground water control.

AREN-604. Structural Systems**Credit 3(3-0)**

The objective is to present building structural systems, their form and function. Also, design criteria, loading types and magnitudes, form work, construction loads, and construction times. Preliminary design techniques are presented and system evaluation techniques will be discussed. Other topics include the portal and cantilever methods of approximate analysis. An introduction to computer-design will also be included.

AREN-605. Masonry Design**Credit 3(3-0)**

Concepts of reinforced masonry design. The properties of masonry materials will be reviewed and the procedures for the design of typical masonry components will be presented.

AREN-606. Matrix Analysis of Structures**Credit 3(3-0)**

Review of Matrix algebra; statically and kinematically indeterminate structures; introduction of flexibility and stiffness methods; application to beams, plane trusses and plane frames.

AREN-610. Energy and the Environment**Credit 3(3-0)**

This course covers the global energy resources, consumption and pollution generation due to energy use. Various environmental regulations will be surveyed and the potential effect of new technologies and policies on the environment and global economy will be studied. Design projects are required.

AREN-611. Energy Conservation in Buildings**Credit 3(3-0)**

This course deals with the energy use patterns in schools and hospitals. Various utility rate structures and the relevant IES and ASHRAE Standards are examined. Energy auditing techniques along with the effect of operation and maintenance on building energy use are studied. Retrofit options and computerized Energy Management Systems are covered. Design projects are required.

AREN-612. HVAC System Design**Credit 3(3-0)**

This course deals with the fluid flow theory, duct-pipe design and selection of fans and pumps. Design methodology in sizing heat exchangers, terminal units, air controllers, air washers and cooling towers is covered. Primary and secondary systems are also studied. Design projects are required.

AREN-620. Architectural Design IV**Credit 3(3-0)**

Laboratory-lecture course presenting a series of problems in the design, analysis, and organization of buildings. Economic and social considerations are given to problems. Group planning, mass and orientation are studies for more complex building requirements. More detailed study and presentation is required to emphasize the complete architectural complex.

AREN-621. Advanced Architectural Design**Credit 3(3-0)**

This course includes advanced studies in architectural design. The projects deal with various aspects of building design, urban design, and community design in a comprehensive and integrated manner. Prerequisite: AE 620 or Graduate standing.

AREN-622. City Planning and Urban Design**Credit 3(1-4)**

Lecture and laboratory course. History of city planning and urban design; general problems of city planning and urban design-architectural space composition. Regional and urban planning; scale of the plan for region and city. Transportation in the city; the city as a human unit. Greenery in the city. Location of the residential areas, industry, business and commerce, etc. Location criteria. Design of the neighborhood unit. Prerequisite: Juniors enrolled in the program of the Transportation Institute and Architectural Engineering majors of Junior classification. Open to practicing design professionals.

AREN-623. Integrated Building Design I**Credit 3(0-6)**

Introduction to the holistic design approach including the functional and economic evaluation of alternative building systems from conceptual design, design development and construction documents. Topics include the principles of design, building code requirements, structural systems, M-E-P Systems and construct ability.

AREN-624. Facilities Management**Credit 3(3-0)**

Topics include: long range and master planning for facilities; space forecasting, planning and management; the design-build cycle; project management; forming and managing the design team; standards; budget justification; project estimating; purchasing; post occupancy evaluation.

AREN-625. Computer-Aided Building Design**Credit 3(0-6)**

Computer-aided drafting and design for architectural engineering problems. Introduces the student to the use of programs such as AUTO CAD as a design and production tool.

AREN-642. Lighting Applications I**Credit 3(3-0)**

This course applies to the principles of lighting design to the engineering of lighting systems. The course develops methodology for solving problems in both interior and exterior lighting.

AREN-660. Selected Topics in Engineering**Credit 3(3-0)**

Selected engineering topics of interest to students and faculty. The topics will be selected before the beginning of the course and will be pertinent to the programs of the student enrolled. Prerequisite: Consent of the instructor.

AREN-666. Special Projects**DIRECTORY OF FACULTY**

Ronald N. Helms, P.E., B.Arch., M.S. AE., University of Illinois; Ph.D., Ohio State University; Chairperson; Professor

Peter Rojeski, Jr., P.E., B.S., Clarkson College of Technology; M.S., Ph.D., Cornell University; Associate Professor

Elias G. Abu-Saba, B.S.M.E., American University of Beirut; M.S.C.E., Ph.D., Virginia Polytechnic Institute; Professor

Reginald C. Whitsett, B.S., North Carolina A&T State University M.S., North Carolina State University; Associate Professor

Harmohindar Singh, P.E., B.Sc., M.Sc., Punjab University; M.S., Ph.D., Wayne State University; Professor

Ronnie S. Bailey, B.A., Howard University; M.U.P., University of Wisconsin; Assistant Professor

William Mark McGinley, B.S., M.S.C.E., Ph.D., University of Alberta; Associate Professor

Mike Ellis, P.E., BSEE, Brigham Young University; MSEE, Rensselaer Poly Institute; Ph.D., Virginia Poly State University; Associate Professor

Department of Chemical Engineering

Franklin G. King, Chairperson

OBJECTIVES

The primary objective of the Department of Chemical Engineering is to provide students with a learning experience that will instill in them a lifelong sense of learning, social responsibility, and commitment to improving the quality of life for all people in North Carolina. The Department seeks to provide an atmosphere of dedicated service to the student by pro-

viding counseling, program planning, career guidance, and any other supportive student services to facilitate student growth and success in the academic and professional communities.

The chemical engineering curriculum is designed to provide students with a strong foundation in chemistry, physics, and mathematics, with the emphasis gradually shifting toward chemical engineering courses in the junior and senior years. The program provides students with the knowledge to apply basic skills and sound judgment to develop designs for economically for converting materials and energy into useful products for the benefit of our society and culture. The chemical engineering curriculum includes a design experience which integrates various facets of design throughout the curriculum. The senior design sequence acts as a "capping stone" which coordinates all technical aspects of the chemical engineering curriculum. The social sciences and humanities background is included so the students obtain a well-rounded education.

Specifically, the chemical engineering program strives to develop a sound and broad background in the fundamental areas of chemical engineering and stresses the development of design, analysis and problem solving skills. The program is intended to prepare students to enter the chemical engineering profession or to continue their education towards an advanced degree.

DEGREES OFFERED

Chemical Engineering - Bachelor of Science

*Engineering - Master of Science

**See Graduate School Bulletin*

GENERAL PROGRAM REQUIREMENTS

See College of Engineering Undergraduate Admission policy statement. For graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENTAL REQUIREMENTS

The chemical engineering major must complete 128 credit hours following the approved departmental curriculum. Majors must also satisfy all University and College of Engineering requirements. At the beginning of the senior year the student must select one of the chemical engineering option blocks from which he/she must select three (3) elective courses which contain at least two credits of engineering design.

ACCREDITATION

The undergraduate program in chemical engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

CAREER OPPORTUNITIES

Chemical engineers have a broad enough background to do almost anything they choose. All branches of engineering emphasize the application of principles of mathematics and physics to solve problems and to create products for the community at large. Chemical engineers however, are unique in emphasizing applications which are also founded in chemistry. Chemical engineers are primarily concerned with processes and equipment in which material changes in composition or state. The traditional chemical engineer often becomes employed by a company which manufactures a variety of chemical products including plastics, forest products, gasoline, food, textile fibers, and pharmaceuticals. The assignment given to chemical engineers can be highly diverse, ranging from design, construction, operations

research, and product development to technical sales and management. A career in chemical engineering is often a route to top management.

More recently, chemical engineers are finding opportunities in the fabrication of micro-electronic devices, in the conversion of coal to fuels, in the control of industrial and municipal wastes, and in the application of biological science to produce chemicals from biomass through genetic engineering.

In addition to the industrial opportunities that await chemical engineering graduates, opportunities exist for graduate study in engineering as well as such diverse areas as medicine, law, business and biotechnology. In view of the many options open to its graduates, chemical engineering can be a particularly good choice for students who have broad interests, but have not yet defined their career objectives.

The future prospects for chemical engineering are also very bright. As our society becomes more complex, there will be a growing need to get the most out of the limited supplies of natural resources. Chemical engineers will be in demand to find solutions to problems arising from production of energy and chemicals from renewable resources and for the efficient utilization of available resources.

The chemical engineering curriculum is designed to give students the knowledge and scientific tools needed to prepare them for a career in industry or to go on to graduate school. It is also intended to be flexible enough to accommodate a broad range of educational interests. Sufficient electives have been provided so that a student can select a senior area option based on their interests.

CURRICULUM GUIDE FOR CHEMICAL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEEN 100	2	GEEN 102	2
CHEM 106	3	CHEM 107	3
CHEM 116	2	PHYS 241	3
ENGL 100	3	PHYS 251	1
MATH 131	4	ENGL 101	3
Social Science Elective	3	MATH 132	4
	<u>17</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEN 200	4	CHEN 220	3
CHEM 221	3	Advanced Science Elective	3
CHEM 223	2	MATH 331	3
PHYS 242	3	MEEN 260	2
PHYS 252	1	Social Science Elective	3
MATH 231	4	Humanities Elective	3
	<u>17</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEN 300	3	CHEN 320	3
CHEN 310	4	CHEN 330	2
CHEM 441	3	CHEN 340	3
MEEN 335	3	Advanced Chemistry Elective	3
Humanities Elective	3	CHEM 443	1
Health/Phys Ed Elective	1	ELEN 200	3
	<u>17</u>		<u>15</u>

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CHEN 400	3	CHEN 440	3
CHEN 410	2	Elective (CHEN Option)	3
CHEN 420	3	Elective (CHEN Option)	3
CHEN 430	3	CHEN 450	1
CHEN 500	0	Soc. Sci./Human. Elective	2
Elective (CHEN Option)	3	Soc. Sci./Human. Elective	2
Health/Phys Ed Elective	1		<u>14</u>
	<u>15</u>		

Total Credit Hours: 128

CHEMICAL ENGINEERING ELECTIVE PACKAGE

The chemical engineering program has a total of 11 elective courses. The courses must be distributed in the areas as discussed below:

I. Chemical Engineering Option Electives (3 Courses)

Three upper level engineering electives are generally taken in the senior year. All courses must be taken from one of the option blocks offered by the department. The elective courses must be selected so that the option contains at least two credits of engineering design. The following list of courses have one credit of design: CHEN 505, 520, 530, 540, 600 and 605. The following list of courses have two credits of design: CHEN 525, 535 and 545. CHEN 510 has a variable design content. Students must consult their advisors in selecting technical electives. The department offers option blocks in the following areas:

- A. Advanced Chemical Engineering
- B. Biochemical Engineering
- C. Industrial Processes
- D. Environmental Engineering

The Advanced Chemical Engineering option is the most general option. In that option, you can select any three technical electives with the only restriction being that two of the courses must be chemical engineering courses which contain at least two credits of engineering design. The Biochemical Engineering option consists of BIOL 121, Microbiology, CHEN 605, Biochemical Engineering, and CHEN 510, Independent Study. The Industrial Process Engineering option consists of both of the Fuels and Petrochemicals courses, CHEN 520 and CHEN 525, and a technical elective. The Environmental Engineering option consists of a chemical engineering elective and two civil engineering

courses, CIEN 310, Environmental Engineering, and CIEN 510, Environmental Design. A course in Air Pollution Control or Biochemical Engineering is recommended. The design content of chemical engineering elective courses is as follows:

CHEN 505	Selected Topics	1 credit
CHEN 510	Independent Study	Variable (0-3 credits)
CHEN 520	Fuels & Petrochemicals	1 credit
CHEN 525	Fuels & Petro. Design	2 credit
CHEN 600	Adv. Process Control	1 credit
CHEN 605	Biochemical Engineering	1 credit
CHEN 610 - CHEN 630		None
CIEN 410	Water/Wastewater Engineering	2 credits

II. Social Sciences and Humanities Electives (6 Courses)

Students must take two related 3-credit courses in humanities (H) and two related 3-credit courses in social sciences (SS). Students must also take two additional SS/H electives with the only restriction being that they must have a total of at least 4 credits. The University requires, for students entering in fall 1995 or later, two electives in African-American studies or other multi-cultural studies. The approved list of social science and humanities electives and several elective concentrations are listed in the Appendix of the department handbook. Students must note that courses in fine arts and certain skills courses are not SS/H electives. Courses like speech, technical writing, vocabulary building, logic or personal finance are skills courses. Courses involving active learner participation, like acting, drawing, painting, photography and learning to play a musical instrument are fine arts courses.

III. Advanced Science Electives (6 credits)

The following list of courses have been approved to satisfy the advanced science electives. Students must take at least 3 credits of advanced chemistry.

APPROVED ADVANCED SCIENCE ELECTIVES

CHEM 222	Organic Chemistry II
CHEM 231	Quantitative Analysis I
CHEM 232	Quantitative Analysis I Lab
CHEM 442	Physical Chemistry II
CHEM 444	Physical Chemistry II Lab
CHEM 651*	Biochemistry
BIOL 121	Microbiology
PHYS 404	Physical Optics
PHYS 406	Modern Physics
PHYS 415	Electromagnetism I
	Polymer Chemistry
	Material Science

**If approved by the Chemistry Department*

COURSES WITH DESCRIPTION IN CHEMICAL ENGINEERING

Undergraduate

CHEN-200. Chemical Process Principles

Credit 4(4-0)

This course is an introduction to the analysis of chemical processes with an emphasis on mass and energy balances. Stoichiometric relationships, ideal and real gas behavior are also covered. Topics also include an introduction to the first law of thermodynamics for open and closed systems and the solution of problems with comprehensive mass and energy balance calculations. Prerequisites: CHEM 106, ENGL 101, GEEN 102, MATH 131; Corequisite: CHEM 107, MATH 132, PHYS 241.

CHEN-220. Intro Chemical Engineering Analysis and Design

Credit 3(3-0)

This course covers the use of the ASPEN PLUS simulation package for process design and development. Numerical methods are applied to the solution of chemical engineering problems. Roots of equations, matrix manipulation, numerical integration and systems of algebraic equations and ordinary differential equations are covered. Statistical analysis, including data smoothing and modeling, linear and nonlinear regression is introduced. Prerequisites: CHEM 107, MATH 132, PHYS 241, CHEN 200.

CHEN-300. Transfer Operations I

Credit 3(3-0)

Topics covered are the application of macroscopic equations to the study of chemical engineering operations involving fluid flow in pipes, past immersed bodies, motion of particles in fluids and transportation and metering of fluids. A design project on the design of piping networks, fluid flow or metering equipment is included. Prerequisites: CHEN 200 (with a grade of C or higher), PHYS 242, MATH 231. Corequisite: MATH 331.

CHEN-310. Chemical Engineering Thermodynamics

Credit 4(4-0)

The course is a study of thermodynamics principles with special emphasis on chemical process applications and equilibria. Topics included are the first and the second laws, properties of single and multi-component systems, expansion and compression of fluids, heat engines, thermodynamics of flow processes, phase equilibria and chemical reaction equilibria. Prerequisites: MATH 231, CHEN 200 (with a C or higher); Corequisite: CHEM 441.

CHEN-320. Transfer Operations II

Credit 3(3-0)

This course covers applications of energy balance equations to heat transfer operations involving conduction, convection and radiation with emphasis on the macroscopic approach. Topics in diffusion and diffusional operations are also covered. A course project on the design of heat transfer equipment is required. Prerequisites: CHEN 300 (with a C or higher), CHEN 310, MATH 331, CHEM 441.

CHEN-330. Chemical Engineering Laboratory I

Credit 2(0-6)

Students conduct laboratory studies on unit operations involving fluid flow, process dynamics and heat transfer. The studies include open-ended experiments and comparisons between theory and experimental results. Statistical analysis of data, experimental design, laboratory safety and quality reporting are stressed. Students are required to complete formal and informal reports and make oral presentations with visual aids. Prerequisites: ENGL 101, MATH 331, CHEN 300, CHEN 310, CHEM 441. Corequisite: CHEN 320.

CHEN-340. Process Dynamics and Control

Credit 3(3-0)

The course covers the methods for controlling chemical process equipment including the dynamic response of process equipment and systems. Simulation methods are stressed in the design of control systems. Modes of control, controller characteristics and control loop design are stressed. Computer control and statistical process control are introduced. Prerequisites: MATH 331, CHEN 300, CHEN 310, CHEM 441, CHEN 220; Corequisite: CHEN 320.

CHEN-400. Stagewise Operations**Credit 3(3-0)**

This course is a study of stagewise separation principles. Topics include the quantitative treatment and design of mass transfer equipment involving equilibrium stage contacting. Operations include distillation, absorption, extraction, drying and humidification. Prerequisite: CHEN 320 (with a grade of C or higher).

CHEN-410. Chemical Engineering Laboratory II**Credit 2(0-6)**

This course is a continuation of CHEN 330 with emphasis on open-ended laboratory studies. Topics include heat transfer, mass transfer, thermodynamics, process control and reactor design. Statistical analysis of data, laboratory safety, laboratory equipment development, oral and written reports are emphasized. Prerequisites: CHEN 320, CHEN 330. Corequisites: CHEN 400, CHEN 420.

CHEN-420. Chemical Reaction Engineering**Credit 3(3-0)**

The course covers the fundamentals of chemical kinetics, rate theories and reactor design. Heat transfer and non-ideal flow behavior are emphasized. Heterogeneous systems and catalysis are introduced. Students design chemical reactors for batch and flow systems. Prerequisites: CHEM 221, CHEN 310, CHEN 320 (with a C or higher).

CHEN-430. Process Design I**Credit 3(2-2)**

The steps in creating a chemical process design from concept to completion and plant operation are studied. Topics included are engineering economics, simulation, process equipment design, ethics, and process safety. Statistical analysis of a process, including F-Tests and Chi Square Tests, is discussed. Students complete an open-ended process component design. Corequisite: CHEN 400.

CHEN-440. Process Design II**Credit 3(1-4)**

This capstone design course emphasizes the design of a complete chemical process including literature survey, mass and energy balances, flow diagrams, equipment selection and design, and cost and economic analysis. Students develop and use computer-aided simulation to model process equipment design. Projects include extensive use of the ASPEN PLUS simulation package. Oral and written presentations of the design projects are required. Prerequisites: CHEN 400, CHEN 420, CHEN 430.

CHEN-450. Chemical Engineering Senior Seminar**Credit 1(1-0)**

Selected topics of interest to senior chemical engineering majors are presented. Topics include ethics, chemical plant safety, industrial careers, and interviewing techniques. Preparation for the senior comprehensive exam and the fundamentals of engineering exam is included. Prerequisite: Senior standing in chemical engineering.

CHEN-500. Chemical Engineering Seminar**Credit 0(0-0)**

This course is the presentation and discussion of selected topics of interest to chemical engineering students such as ethics, professionalism, careers in chemical engineering, graduate school, and AIChE.

CHEN-505. Selected Topics in Chemical Engineering**Credit 3(3-0)**

An in-depth lecture course covering several advanced topics in chemical engineering. Topics will be selected to match student interest and faculty expertise. A specific course description will be available at the beginning of each semester that the course is offered. Prerequisite: Senior standing in CHEN courses.

CHEN-510. Independent Study in Chemical Engineering**Credit 3(0-6)**

An Independent study project is completed on a single topic in chemical engineering. Topics are arranged to fit the interest of the student and a faculty advisor. The study includes the design of an apparatus, a process or a procedure with economic, environmental, safety and other considerations. Prerequisite: Senior standing in CHEN courses.

CHEN-520. Fuels and Petrochemicals**Credit 3(3-0)**

Topics important to the production of fuels are covered. Topics include extraction and processing of fossil fuels, synfuels, and fuels from renewable resources. Topics also include distillation, refining, fermentation, catalytic reactions, and removal of undesirable by-products. The design of fuel processes include emphasis on economic and environmental impact. Prerequisite: Senior standing in chemical engineering.

CHEN-525. Fuels and Synfuels Process Design**Credit 3(2-2)**

The design of a fuel conversion process is emphasized. The design includes extraction or mining of raw fuel, treatment of raw fuel and conversion to energy or to useful chemicals. Economic, environmental and safety factors are also considered in the design. Prerequisite: CHEN 520.

CHEN-530. Basic Food Process Engineering**Credit 3(3-0)**

This course covers basic food processing topics including food preparation operations. Topics included are slurry flow, processing operations, microbiology and health hazards, diseases and medicines, and their effects on humans. Prerequisite: Senior standing in CHEN courses.

CHEN-535. Food Processing Design**Credit 3(3-0)**

Design of canning, bottling, and similar food processing operations, production and optimization techniques for basic, prepared, and synthetic foods. Prerequisite: CHEN 530.

CHEN-540. Forest Products Engineering**Credit 3(3-0)**

Basic chemical and mechanical properties of forest products including pulp and paper, combustion, and mechanics of forest products. Conversion of forest products into lumber, paper, fuels, and foods and others. Prerequisite: Senior standing in CHEN courses.

CHEN-545. Forest Product Chemical Design**Credit 3(3-0)**

Design of operations in the processing of forest products including design of industrial operations in the manufacture of paper, fuels, foods, furniture and other forest chemicals and products. Prerequisite: CHEN 540.

CHEN-550. Computer-Aided Chemical Process Design**Credit 3(2-2)**

The development and use of computer-aided models for process equipment design is stressed. Model results are compared with the ASPEN PLUS simulation package. Students study of the interrelationships between design and process variables using computer simulation. Optimization methods are applied to chemical process design. Prerequisites: CHEN 400, CHEN 420, CHEN 430; Corequisite: CHEN 440.

Advanced Undergraduate Courses**CHEN-600. Advanced Process Control****Credit 3(3-0)**

The course covers advanced methods for controlling chemical processes. Adaptive control, feed forward control, cascade control, multi-variable control, multi-loop control, and programmable logic controllers are discussed. Emphasis is placed on computer control using Z-transforms, sampled-data systems, and digital controller design. Prerequisites: CHEN 340, senior standing in CHEN courses.

CHEN-605. Biochemical Engineering**Credit 3(3-0)**

The course covers the application of engineering principles to the design and control of fermentation processes. Topics included are biochemical production of industrial chemicals, mixer design, oxygen transfer in fermentors and the separation of fermentor effluents. Corequisites: CHEN 400, CHEN 420.

CHEN-610. Advanced Chemical Engineering Thermodynamics **Credit 3(3-0)**

This is an advanced course covering topics in molecular thermodynamics of fluid phase equilibria. Statistical thermodynamics and thermodynamics of nonequilibrium processes are introduced. Prerequisite: CHEN 310.

CHEN-620. Advanced Chemical Engineering Analysis **Credit 3(3-0)**

Students apply advanced mathematical techniques to the solution of chemical engineering problems. Analytical and numerical methods for analysis of steady state and transient problems arising in heat and mass transfer, kinetics and reaction design are developed. Prerequisite: Senior standing in CHEN courses.

CHEN-630. Transport Phenomena **Credit 3(3-0)**

A unified approach is used to study momentum, energy, and mass transfer with emphasis on the microscopic approach. Differential transport balances are developed and applied to solving chemical process problems. Prerequisites: CHEN 320 (with a C grade or higher), MATH 331.

CHEN-650. Interfacial and Membrane Phenomena **Credit 3(3-0)**

Fundamental principles of phase interfaces: surface tensions, contact angles and dispersive forces. Study of suspension, emulsions and foams. Applications in wetting, floatation, coating and dyeing. Membrane structure. Membrane transport processes, membrane separation technique. Corequisite: CHEN 400.

DIRECTORY OF FACULTY

Yusuf G. Adewuyi, B.S., Ohio University; M.S., Ph.D., University of Iowa; Associate Professor

Shamsuddin Ilias, B.S., Bangladesh University of Eng. and Tech.; M.S., University of Petro. and Min. (Saudi Arabia); Ph.D., Queen's University; Assistant Professor

Vinayak N. Kabadi, B.ChE., Bombay University; M.S., S.U.N.Y. at Buffalo; Ph.D., Pennsylvania State University; Associate Professor

Franklin G. King, B.S., Pennsylvania State University; M.S., Kansas State University; M.Ed., Howard University; D.Sc., Stevens Institute of Technology; Professor and Chairperson

Keith Schimmel, B.S., Purdue University; M.S., Ph.D., Northwestern University; Assistant Professor

Gary B. Tatterson, B.S., University of Pittsburgh; M.S., Ph.D., Ohio State University; Professor

Gary L. White, B.S., M.S., Brigham Young University; Ph.D., Michigan State University; Assistant Professor

Department of Civil Engineering

Gary S. Spring, Interim Chairperson

OBJECTIVES

The civil engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The program is comprised of a core curriculum with upper level design specialization in environmental, water resources, transportation, construction, geotechnical, and structures. These upper level design courses provide the bulk of the design content.

The educational objectives of the program are:

- (1) To provide a civil engineering program that will educate students to be technically competent, responsible, socially conscious, and productive professionals in fields of

Civil Engineering important to the industrialization, environmental protection, and well being of the global community.

- (2) To provide an undergraduate educational program that will prepare students for graduate studies in all the major Civil Engineering specialties.
- (3) To provide the environment for a challenging research program for graduate and undergraduate student projects and theses.
- (4) To provide a program to address the civil and environmental engineering educational needs of the Piedmont-Triad Community.
- (5) To provide opportunities for professional experiences and scholarships for our students.

Civil engineering specialties: structural, transportation, geotechnical, construction, environmental and water resources engineering.

DEGREES OFFERED

Civil Engineering - Bachelor of Science

*Engineering - Master of Science

*See *Graduate School Bulletin*.

GENERAL PROGRAM REQUIREMENTS

See College of Engineering Undergraduate Admission policy statement. For graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENTAL REQUIREMENTS

The Civil Engineering Major must complete the required 128 hour curriculum with a 2.00 cumulative grade point average for all University and all Civil Engineering courses.

CAREER OPPORTUNITIES

Civil engineers are employed in the planning, designing and construction of transportation, environmental, water resources, geotechnical and structural systems. They may work in private practice, government, and industry. Many civil engineers are licensed as professional engineers in the state in which they practice. Some civil engineers are employed in university teaching and in research which usually requires an advanced degree. Civil engineers are in demand in construction, transportation and government and B.S. degree holders in Civil Engineering generally receive excellent starting salaries.

CURRICULUM GUIDE FOR CIVIL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 131	4	MATH 132	4
CHEM 101	3	PHYS 241	3
CHEM 111	1	PHYS 251	1
GEEN 100	2	ENGL 101	3
HIST Elective	3	GEEN 101	2
ENGL 100	3	GEEN 102	2
	<hr/> 16	PHED Elective	<hr/> 1
			16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 231	4	MATH 331	3
PHYS 242	3	CIEN 204	3
MATH 224	3	MEEN 336	3
MEEN 335	3	MEEN 337	3
ENGL 331	3	Science Elective	3
PHED Elective	1	Soc.Sci./Hum. Elective	2
	<u>17</u>		<u>17</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CIEN 310	3	CIEN 320	3
CIEN 311	1	CIEN 321	1
CIEN 330	3	CIEN 350	3
CIEN 331	1	CIEN 351	1
CIEN 340	3	CIEN 360	3
CIEN 341	1	CIEN Elective	3
CIEN 362	3	CIEN Elective	3
CIEN 363	1		<u>17</u>
	<u>16</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
CIEN Elective	3	CIEN 400	3
CIEN Elective	3	CIEN Elective	3
Soc.Sci./Hum. Elective	2	CIEN 401	1
INEN 260	2	Humanities Elective	3
ELEN 200 or	3	HIST Elective	3
MEEN 441			<u>13</u>
Humanities Elective	3		
	<u>16</u>		

Total Credit Hours: 128

Fall Design Electives

CIEN 520 Geotechnical Design	3
CIEN 550 Transportation Design	3
CIEN 560 Water Resources Design	3

Spring Design Electives

CIEN 510 Environmental Design	3
CIEN 530 Construction Design	3
CIEN 540 Structural Design	3

COURSES WITH DESCRIPTION IN CIVIL ENGINEERING

Undergraduate

CIEN-204. Surveying

Credit 3(2-3)

This course is an introduction to Plane surveying. Topics covered in this course include: the use of surveying instruments, theory of measurements and sources of error, traverse computations, stadia measurements, differential and profile leveling, topographic mapping, and

earthwork surveys. Prerequisite: MATH 131 and MATH 110 or High School Trigonometry, or the permission of the instructor.

CIEN-310. Environmental Engineering

Credit 3(3-0)

Introduction to environmental pollution. Topics include: Physical, chemical and biological water quality parameters, water purification processes in natural systems, air pollution and solid waste management, and general design of waste control systems. Prerequisite: Junior standing.

CIEN-311. Environmental Engineering Laboratory

Credit 1(0-3)

Selected experiments on the measurement of environmental pollutants. Topics include: Use of microscope, Gram stain, coliform analysis, pH, alkalinity, hardness, DO, BOD, and control of microorganisms. Corequisite: CIEN 310.

CIEN-320. Geotechnical Engineering

Credit 3(3-0)

This course will introduce the following topics: engineering mechanics and properties of soils; stresses and settlements in soils; earth pressures on structures; stability of slopes and embankments; and fundamentals of foundation selection and design. Prerequisites: CIEN 362 & 363.

CIEN-321. Geotechnical Engineering Laboratory

Credit 1(0-3)

This course will provide laboratory experiences: in soil identification, classification, permeability, consolidation, indexing, and laboratory evaluation of shear and bearing strength of soils. Prerequisites: CIEN 362 & 363. Corequisite: CIEN 320.

CIEN-330. Construction Materials

Credit 3(3-0)

The course covers the manufacture and properties of mineral and bituminous cements and mineral aggregates. It explores the mechanical and chemical properties of portland cement concrete, bituminous concrete, masonry units, and timber products. Prerequisites: CIEN 204, MEEN 336.

CIEN-331. Construction Materials Laboratory

Credit 1(0-2)

This course offers an introduction to testing techniques for construction materials including concrete, masonry, wood and bitumen. Corequisite: CIEN 330.

CIEN-340. Structural Analysis

Credit 3(3-0)

This course introduces the concepts of structural analysis for determinate and indeterminate structural systems using both hand calculations and computer applications. Prerequisite: MEEN 336.

CIEN-341. Structural Engineering Laboratory

Credit 1(0-3)

This laboratory course will introduce the student to laboratory methods in experimental structural analysis and tests to reinforce structural concepts from CIEN 340. Computer applications will be used as required to illustrate structural behavior. Prerequisite: MEEN 336. Corequisite: CIEN 340.

CIEN-350. Highway Engineering

Credit 3(3-0)

This course focuses on one mode of transportation, highway engineering. The major aspects of highway engineering covered are: administration and finance, traffic engineering, traffic operations and safety, geometric design, highway materials, structural design, and highway planning and economics. Corequisite: CIEN 204.

CIEN-351. Transportation Engineering Laboratory

Catalogue Description

Credit 1(0-2)

This laboratory provides a review of statistical analysis techniques, experimental design concepts, and data presentation and reports. A variety of traffic engineering studies are conducted throughout the semester, including volume, speed, travel time, delay, accident, saturation

flow and parking studies. The last three to four lab sessions are devoted to student presentations of term papers. Corequisite: CIEN 350.

CIEN-360. Hydrology

Credit 3(3-0)

The study of hydrologic cycle with emphasis on the application of surface and subsurface hydrology in water systems. Topics include: hydrologic cycle, rainfall-runoff relationships, unit hydrograph analysis, stream flow, flood routing, aquifer characteristics, and frequency analysis of hydrologic data. Prerequisite: Junior standing.

CIEN-362. Hydraulics

Credit 3(3-0)

This is a first level hydraulics course. Topics include: properties of fluids, hydrostatic pressure and manometry, the Bernoulli and energy equations for steady flow, energy and hydraulic grade lines, headloss calculations, momentum principle, flow and velocity measurement, pumps, branched and looped pipe systems, Hardy-Cross method, open channel flow, sub- and super-critical flow, hydraulic jump and dimensional analysis. Prerequisites: MEEN 335, MATH 231. Corequisite: CIEN 363.

CIEN-363. Hydraulics Laboratory

Credit 1(0-2)

This course includes a set of laboratory exercises designed to reinforce and demonstrate the concepts presented in CIEN 362. Topics include: graphical analyses of experimental data, fluid properties, manometry, hydrostatic forces on surfaces, Bernoulli and energy equations demonstrations, impact of a jet, orifice flow, pipe friction, in-line flow meters, broad- and sharp-crested weirs, water surface profiles (HEC-2 Software), hydraulic jump and flow through sills and throats. Corequisite: CIEN 362.

CIEN-400. Civil Engineering Systems Design

Credit 3(2-2)

Team solution of a practical and comprehensive civil engineering design project. Prerequisite: Senior standing.

CIEN-401. Senior Seminar

Credit 1(0-2)

This course is used to prepare the student for the Senior Exam which is given as the final exam for the course. Included also are discussions on ethics and professionalism. Each student prepares and presents to the class an original paper on a topic of engineering importance. Prerequisite: Senior standing.

CIEN-416. Solid Waste Management

Credit 3(3-0)

The study of the collection, storage, transport and disposal of solid wastes. Examination of various engineering alternatives with appropriate consideration for air and water pollution control and land reclamation. Prerequisite: Senior standing.

CIEN-450. Geometric Design of Highways

Credit 3(3-0)

Development and application of geometric design concepts for rural and urban highways. Topics include: functional classifications, design controls and criteria, elements of design, cross section elements, and intersection design. Prerequisite: CIEN 350.

CIEN-456. Traffic Engineering

Credit 3(2-2)

Theory and practice of the supply side of Highway Engineering. Specific applications will deal with the operation, design and control of highways and their networks. Topics include: data collection techniques and the use of data in performing economic and performance studies, what those studies are and how to perform them, traffic flow theory, highway capacity and network analysis. The student will be introduced to the use of various computer applications software available for each topic. Prerequisite: CIEN 350.

CIEN-458. Pavement Design

Credit 3(3-0)

Design of highway and airport pavement structures. Topics include: flexible and rigid pavement, cost analysis and pavement selection, drainage, earthwork, pavement evaluation and maintenance. Prerequisite: CIEN 350.

- CIEN-460. Water Resources Engineering** **Credit 3(3-0)**
Application of hydrologic and hydraulic principles in the analysis and design of water resources systems. Topics include hydraulic structures, system economics, water law, irrigation, hydroelectric power, navigation, flood control and water resources planning. Prerequisite: CIEN 360.
- CIEN-480. Construction Engineering** **Credit 3(3-0)**
Introduction to construction engineering emphasizing heavy and highway construction. Organization of construction industry; construction equipment, methods, and management; safety and environmental health in construction; project planning and scheduling. Prerequisite: Senior standing.
- CIEN-482. Construction Project** **Credit 3(1-4)**
Integrated approach by student teams to design, estimating, planning, scheduling and management of construction projects. Prerequisite: CIEN 480.
- CIEN-510. Environmental Engineering Design** **Credit 3(3-0)**
This course defines the analysis and design of water and wastewater treatment systems. Topics included in the course are: analysis and functional design of physical, chemical and biological treatment processes; pump stations; and sludge treatment processes. CIEN 310.
- CIEN-520. Geotechnical Engineering II** **Credit 3(3-0)**
This course is a continuation of CIEN 320 with emphasis on the behavior and design of retaining walls and shallow and deep foundations. Also, this course will introduce the following topics: earth pressure; bearing capacity; settlement; behavior and design of anchored bulkheads, excavation bracing and buried structures; and response of deep foundations to vertical and horizontal loads. Prerequisites: CIEN 320 & 321.
- CIEN-522. Foundation Design** **Credit 3(3-0)**
The design of foundations for structural systems using geotechnical analysis and subsurface explorations. Designs considered include shallow and deep foundations, retaining structures, earth slope stability systems and soil and site improvements. Prerequisite: CIEN 320.
- CIEN-540. Structural Engineering Design** **Credit 3(3-0)**
This course will introduce the student to the design of reinforced concrete, steel and timber structures. Consideration will be given to simple structural systems as designed for each material. Prerequisite: CIEN 340.
- CIEN-550. Transportation Design** **Credit 3(3-0)**
This course introduces students to the transportation design process through a series of comprehensive transportation design projects. Emphasis is placed on the utilization of existing facilities and creation of efficient new facilities through transportation systems management techniques. Energy, environment, mobility and community impacts are considered as measures of effectiveness in the design process. Prerequisite: CIEN 350.
- CIEN-560. Water Resources Engineering Design** **Credit 3(2-2)**
This course involves the application of hydrologic and hydraulic principles in the analysis and design of water resources systems. The measurement of ground water parameters and general water quality parameters is covered. Topics covered include: water supply and distribution, reservoirs, water law, hydroelectric power, flood control, water resources planning and development and storm water drainage. The use of HEC-2 software for flood plain modeling is introduced. Prerequisites: CIEN 360, 362, & 363.
- CIEN-570. Construction Design** **Credit 3(3-0)**
This course covers construction engineering design applications in the construction of buildings, highways, and other civil and industrial facilities. Emphasized materials include: Portland cement concrete mix design and asphalt cement mix design. Construction problem

solutions include: crane selection, positioning, and loading; scheduling of construction materials and personnel; and computer aided design and construction management. Prerequisites: CIEN 330, 331, 340, 341. Corequisites: CIEN 320-321.

CIEN-600. Expert Systems Applications in Civil Engineering **Credit 3(3-0)**

Introductory overview of artificial intelligence with an emphasis on Civil Engineering applications: What they are, how they are applied today, a discussion of when they should and should not be used and what goes into building them. Emphasis is on: task selection criteria, knowledge acquisition and modeling, expert system architectures (control and representation issues), and testing and validation. Course requirements will include the design and development of a working system in a chosen application area. Prerequisite: Senior or Graduate standing.

CIEN-610. Water and Wastewater Analysis **Credit 3(2-3)**

Laboratory and field methods for the measurement and analysis of water. Prerequisite: CIEN 410.

CIEN-614. Stream Water Quality Modeling **Credit 3(3-0)**

Mathematical modeling of water quality in receiving streams. Topics include: The generation of point and nonpoint sources of pollutants; the modeling and prediction of the reaction, transport and fate of pollutants in the stream; and the formulation and solution of simulation models. Prerequisite: CE 410.

CIEN-616. Solid Waste Management **Credit 3(3-0)**

This course emphasizes the study of the collection, storage, transport and disposal of solid wastes. Examination of various engineering alternatives with appropriate consideration for air and water pollution control and land reclamation are considered. Prerequisite: Senior or Graduate standing.

CIEN-618. Air Pollution Control **Credit 3(3-0)**

Introduction to air pollution and its control. Topics include: sources, types, and characteristics of air pollutants; air quality standards; and engineering alternatives for achieving various degrees of air pollution control. Prerequisite: Senior standing.

CIEN-620. Foundation Design I **Credit 3(3-0)**

This course will introduce the following topics: behavior and design of retaining walls and shallow foundations; earth pressure; bearing capacity and settlement; stress distribution and consolidation theories; settlement of shallow foundations. Prerequisite: CIEN 520.

CIEN-622. Soil Behavior **Credit 3(3-0)**

This course will introduce the following topics: behavior of soil examined from a fundamental perspective; review of methods of testing to define response, rationale for choosing shear strength and deformation parameters for soils for design applications. Prerequisite: CIEN 320 or Graduate standing.

CIEN-624. Seepage and Earth Structures **Credit 3(3-0)**

This course will introduce the following topics: seepage through soils; permeability of soils; embankment design; compaction; earth pressures and pressures in embankments; slope stability analysis; settlements and horizontal movements in embankments; and landslide stabilization. Prerequisite: CIEN 320 or Graduate standing.

CIEN-626. Soil and Site Improvement **Credit 3(3-0)**

This course will introduce the following topics: methods of soil and site improvement; design techniques for dewatering systems; grouting; reinforced earth; in-situ densification; stone columns; slurry trenches; and the use of geotextile. Construction techniques for each system are described. Prerequisite: CIEN 320 and Graduate standing.

- CIEN-640. Advanced Structural Analysis** **Credit 3(3-0)**
 This course emphasizes the more complex concepts of structural analysis for determinate and indeterminate structural systems using both hand calculations and computer applications. Prerequisite: CIEN 540.
- CIEN-641. Design of Reinforced Concrete Structures** **Credit 3(3-0)**
 This course emphasizes the more complex concepts of reinforced concrete design. The design of continuous beams, two slabs and beams columns are addressed. Prerequisite: CIEN 540.
- CIEN-642. Design of Prestressed Concrete Structures** **Credit 3(3-0)**
 This course uses the American Concrete Institute (ACI) and American Association of State Highway and Transportation Officials (AASHTO) codes to analyze and design prestressed concrete structures. Prerequisite: CIEN 540.
- CIEN-644. Finite Element Analysis I** **Credit 3(3-0)**
 Analysis of continuous structural systems as assemblages of discrete elements. Applications of the finite element method is made to the general field of continuum mechanics. Convergence properties and numerical techniques are discussed. Prerequisite: MATH 350.
- CIEN-646. Structural Design in Steel** **Credit 3(3-0)**
 This course uses the American Institute of Steel Construction (AISC) code to analyze and design steel structures. Prerequisite: CIEN 540.
- CIEN-648. Water Resources System Analysis** **Credit 3(3-0)**
 This course uses the wood products codes to analyze and design wood structures. Prerequisite: CIEN 540.
- CIEN-660. Water Resources System Analysis** **Credit 3(3-0)**
 Mathematical modeling techniques. Formulation of mathematical representations of complex water resources systems and their evaluation via linear programming, dynamic programming, non-linear programming and by the use of formal heuristics. Models for optimal sewer design, optimal sequencing (or capacity expansion) of projects, reservoir systems planning and management are presented.
- CIEN-664. Open Channel Flow** **Credit 3(3-0)**
 Advanced topics in open channel flow, design of open channels for uniform and nonuniform flow, wave interference, roughness effects, flow over spillways, water surface profiles, and energy dissipation methods. Some computational methods in open channel flow are presented. Prerequisites: MEEN 416 and MEEN 426.
- CIEN-666. Design of Hydraulic Structures and Machinery** **Credit 3(3-0)**
 Analysis and design of water regulating structures including dams, spillways, outlet works, transition structures, conduit systems and gates. Application of basic principles of fluid mechanics and hydraulics to the design and selection of pumps, turbines and other hydraulic machinery. Applications to multi-purpose design involving water supply, irrigation, flood control and navigation. Prerequisites: MEEN 416 and CIEN 360.
- CIEN 668. Subsurface Hydrology** **Credit 3(3-0)**
 Introductory course in subsurface hydrology including: principles of fluid (water) in saturated and unsaturated materials, well hydraulics, various methods of subsurface water flow systems, infiltration theory, and schemes for ground water basin management. Prerequisites: MEEN 416 and CIEN 360.
- CIEN 670. Construction Engineering and Management** **Credit 3(3-0)**
 This course concentrates on the solution to problems in construction engineering and management. A variety of problems from the construction industry is presented to the students. The students form teams to develop solutions to these problems. Topics vary with available

projects and student interest. Graduate students select a project in their area of interest for intensive study and submit a report. Prerequisite: Senior or Graduate standing.

CIEN-699. Special Projects

Credit 3(3-0)

Study arranged on a special civil engineering topic of interest to the student and faculty. Topics may be analytical and/or experimental with independent study encouraged. Prerequisite: Consent of instructor.

DIRECTORY OF FACULTY

Kenneth H. Murray, B.S., M.S., Ph.D., Virginia Polytechnic Institute and State University; Professor and Interim Dean (P.E.)

Shoou-Yuh Chang, B.S., M.S., National Taiwan University; M.S., University of North Carolina at Chapel Hill; Ph.D., University of Illinois at Urbana-Champaign; Professor (P.E.)

M. Reza Salami, B.S., M.E., Virginia Polytechnic Institute and State University; Ph.D., University of Arizona; Associate Professor (P.E.)

Gary S. Spring, B.S., M.S., Ph.D., University of Massachusetts at Amherst; Associate Professor and Interim Chairperson (P.E.)

Emmanuel U. Nzewi, B.S., Michigan Tech. Univ.; Ph.D., Purdue University; Assistant Professor (P.E.)

Richard F. Norris, B.S., Washington State University; M.S., Ph.D. Eng., University of California at Berkeley; Assistant Professor (P.E.)

Department of Computer Science

Joseph Monroe, Interim Chairperson

OBJECTIVES

The objectives of the Department of Computer Science are to provide the opportunity for its students to acquire the educational background necessary to pursue professional careers in computer science or to continue their education toward advanced degrees in computer science. The primary purpose of the Department is to teach theory, abstraction, and design related to the field of computer sciences.

DEGREES OFFERED

Computer Science - Bachelor of Science

Masters of Science in Computer Science

GENERAL PROGRAM REQUIREMENTS

See College of Engineering Undergraduate Admissions policy statement. For graduate degree admission requirements see the graduate school bulletin.

DEPARTMENT DEGREE REQUIREMENTS

The Computer and Information Science major must complete a minimum of 124 semester hours of University courses, including 41 hours in Computer Science courses and 21 hours in mathematics.

ACCREDITATION

The undergraduate program in computer science is accredited by the Computer Science Accreditation Commission (CSAC) of the Computer Science Accreditation Board (CSAB).

CAREER OPPORTUNITIES

The Bureau of Labor Statistics of the U.S. Department of Labor in its "Occupational Outlook for College Graduates" continues to report that the employment outlook for computer-oriented graduates is very good. Opportunities in the area are expected to grow faster than the average of all occupations through the 1990's.

CURRICULUM GUIDE FOR COMPUTER SCIENCE MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMP 100	0	COMP 101	0
COMP 160	4	COMP 165	4
MATH 123	3	MATH 131	4
ENGL 100	3	HIST 262	3
Approved Social Science Elective	3	ENGL 101	3
PE or Health	2	Approved Social Science Elective	3
FRST 100	<u>1</u>		<u>17</u>
	16		

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMP 200	0	COMP 201	0
COMP 280	3	COMP 285	3
MATH 132	4	MATH 331	3
Approved Elective from Humanities Group	3	Approved Elective from Humanities Group	3
SPCH 250	3	PHYS 241	3
MATH 223	<u>3</u>	PHYS 251	1
	16	Free Elective	<u>3</u>
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMP 300	0	COMP 301	0
COMP 360	3	COMP 375	3
COMP 370	3	COMP 385	3
MATH 224	3	MATH 350	3
Science Group (Approved)	4	Science Group (Approved)	4
ENGL 331	<u>3</u>	COMP Elective (Approved)	<u>3</u>
	16		16

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
COMP 400	0	COMP 401	0
COMP 450	3	COMP 510	3
COMP 467	3	COMP Elective (Approved)	6
Science Group (Approved)	3	Business Group	<u>3</u>
COMP 390	3		12
Free Elective	<u>3</u>		
	15		

Total Credit Hours: 124

Credit Summary

Computer Science	47
Mathematics	23
Science	15
General Education	33
Free Electives	<u>6</u>
Total Credits required	124

Computer Science Requirements

COMP 160	Fundamentals of Computer Science	4
COMP 165	Program Design and Analysis	4
COMP 280	Data Structures	3
COMP 285	Design and Analysis of Algorithms	3
COMP 360	Principles of Programming Languages	3
COMP 370	Assembly Language Programming	3
COMP 375	Computer Architecture and Organization	3
COMP 385	Theory of Computing	3
COMP 390	Social Implications of Computing	3
COMP 450	Operating Systems	3
COMP 467	Data Base Design	3
COMP 510	Software Engineering	3
COMP 100/101/200/201/300/301/400/401	Colloquium	0
COMP	Computer Science Elective	<u>9</u>
Computer Science Total		47

Computer Science Electives (3 credits each)

COMP 363	Object Oriented Programming
COMP 366	Electronic Data Processing
COMP 445	An Introduction to Artificial Intelligence
COMP 490	Program Design and Analysis in Ada
COMP 590	Special Topics in Computer Science
COMP 600	Special Topics in Computer Science
COMP 645	Artificial Intelligence
COMP 650	Advanced Operating Systems
COMP 653	Computer Graphics
COMP 662	Computer Aided Instruction
COMP 663	Compiler Design
COMP 670	Advanced Computer Architecture
COMP 676	Computer Network Architecture
COMP 680	Systems Analysis Techniques
COMP 681	Formal Methods
COMP 685	Advanced Design and Analysis of Algorithms
COMP 691	Independent Study
COMP 692	Project Research

Computer Science Electives Offered in other Departments

BUAD 440	Management Information Systems
ELEN 327	Digital Logic
ELEN 427	Introduction to Microprocessors
ELEN 433	Digital Systems Laboratory
ELEN 617	Microprocessor Hardware Design
ELEN 619	Microprocessor Laboratory
ELEN 627	Switching Theory
INEN 400	Intro to Stochastic and Process Simulation
MATH 460	Numerical Analysis
MATH 631	Linear & Non-Linear Programming
MATH 665	Principles of Optimization
MATH 675	Graph Theory

Mathematics

MATH 123	Discrete Math I	3
MATH 223	Discrete Math II	3
MATH 131	Calculus I	4
MATH 132	Calculus II	4
MATH 331	Differential Equations	3
MATH 224	Statistics and Probability	3
MATH 350	Linear algebra	3
Math Total		23

Science (must have a two semester sequence in physics or chemistry)

PHYS 241	Physics I with PHYS 251 lab	4(2-4)
any 11 or more credits from the following list		
BIOL 100	Biology	4(3-2)
BIOL 140	Botany	4(2-4)
BIOL 160	Zoology	4(2-4)
CHEM 100	Physical Science with CHEM 110 lab	4(3-3)
CHEM 106	Chemistry I with CHEM 116 lab	4(3-3)
CHEM 107	Chemistry II with CHEM 117 lab	4(3-3)
EASC 201	Earth and Environmental Science	3(3-0)
EASC 309	Elements of Physical Geology	3(2-2)
PHYS 242	Physics II with PHYS 252 lab	5(3-4)
SLSC 338	Fundamentals of Soil Science	4(2-4)

Science Total 15

General Education (Requirements)

Business & Economics Group		3
ENGL 100	Ideas & Expressions I	3
ENGL 101	Ideas & Expressions II	3
ENGL 331	Technical Writing	3
Humanities Group		6
PHIL 262	Logic (or Humanities Elective)	3
Physical Ed or Health		2
Social Science Group		6
SPCH 250	Speech Fundamentals	3
FRST 100	University Survival	1

General Education Total 33

Business & Economics Group Electives

BUAD 220	Business Environment
BUAD 341	Intro to Management Information Systems
BUAD 426	Human Behavior in Business
BUAD 422	Management Concepts
BUAD 430	Marketing
BUAD 481	Management Science
ECON 300	Principles of Economics (Micro)
ECON 301	Principles of Economics (Macro)

All Computer Science majors must take two classes (six credits) from the Humanities column and two classes (six credits) from the Social Sciences column. Of these four classes, at least one class (three credits) must be from the Black Studies row (either a Black Studies Humanity or a Black Studies Social Science) and at least one class (three credits) must be from the Global Studies row (either a Global Studies Humanity or a Global Studies Social Science). A single class can possibly fulfill both a row and column requirement.

Humanities
6 credits required from this column

Black Studies

3 credits required from this row

ENGL 333	Survey of Afro-American Literature
ENGL 650	Afro-American Folklore
ENGL 652	Afro-American Drama
ENGL 654	Afro-American Novel I
ENGL 656	Afro-American Novel II
ENGL 658	Afro-American Poetry I
ENGL 660	Afro-American Poetry II
FOLA 417*	Literature of Afro-French Expression
FOLA 681*	Selected Afro-French Poets
MUSI 220	History of Black Music in America
MUSI 221	History of Jazz
THEA 630	Black American Drama

Global Studies

3 credits required from this row

FOLA XXX	All foreign language classes
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Other

ART XXX	All Art classes
ENGL 2XX	All humanities classes 200 or above
MUSI XXX	All music classes
THEA XXX	All theater classes
HIST 262	Logic

Social Sciences
6 credits required from this column

Black Studies

3 credits required from this row

HIST 215*	History of Africa to 1800
HIST 216*	History of Africa since 1800
HIST 310	The U.S. Afro-American to 1877
HIST 311	The U.S. Afro-American since 1877
HIST 328	U.S. Slavery, 1619-1865
HIST 412*	Modernization in Africa
HIST	History of Black Culture in the U.S.
HIST 615	Seminar in the History of Black America
HIST 616*	Seminar in African History
POLI 220	Blacks in the American Political System
POLI 445*	Problems of Contemporary Africa
SOCI 314	Black Experience
SPCH 302	Minorities in Mass Media
ECON 615	Economic, Political & Social Aspects of Black Experience
CUIN 627	Afro-American Experience in American Education

Global Studies

3 credits required from this row

HIST 100	World Civilization I
HIST 101	World Civilization II
HIST 215*	History of Africa to 1800
HIST 216*	History of Africa since 1800
HIST 303	Early Modern Europe: Renaissance to 1815
HIST 304	Modern Europe since 1815
HIST 312	History of Religions
HIST 327	History of Latin America
HIST 330	History of the Far East to 1800
HIST 331	History of the Far East since 1800
HIST 332	The Modern Middle East
HIST 412*	Modernization in Africa
HIST 616*	Seminar in African History
POLI 310	Comparative Politics
POLI 444	International Relations
POLI 445*	Problems of Contemporary Africa

Other

HIST XXX	All history classes
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** Note that these courses can be considered either as Black Studies or Gloval Studies, but no single course can fulfill both requirements simultaneously.*

COURSES WITH DESCRIPTION IN COMPUTER SCIENCE

Undergraduate

COMP-100. Computer Science Colloquium 1

Credit 0

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Freshman standing.

COMP-101. Computer Science Colloquium 2

Credit 0

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Freshman standing.

COMP-160. Fundamentals of Computer Science (Formerly:

CS 160-Introduction to Computer Science)

Credit 4(3-2)

This course introduces algorithmic problem solving, computer programming, computer organization (hardware and software), social and ethical issues, and current topics. Students shall write programs for decision making, text manipulation, numerical computation, data base management, and other applications. Hardware topics include electronic gates, switching circuit design, computer architecture, and machine language translation. Prerequisites: None.

COMP 165. Program Design and Analysis (Formerly:

CS 260-Computer Languages)

Credit 4(3-2)

This is the second course in computer science. This course trains the students to design and implement programs in a high level language. It emphasizes problem solving techniques and applications of software engineering principles to design program solutions as cohesive, readable, and reusable modules.

COMP-200. Computer Science Colloquium 3

Credit 0

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Sophomore standing.

COMP-201. Computer Science Colloquium 4

Credit 0

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Sophomore standing.

COMP-280. Data Structures (Formerly: COMP 380)

Credit 3(3-0)

This is the third course in the computer science sequence. It introduces abstractions (algorithm, data type, complexity) and programming tools (pointers, dynamic memory, and linked data structures). The course also examines essential data structures, (stacks, queues, trees, linked lists, and graphs). It analyzes and implements techniques such as hashing, sorting, searching, and priority queues, to solve general problems. The emphasis of the course is on building modular programs that can be changed to use different data structures and algorithms. Prerequisites: COMP 165, MATH 123.

COMP-285. Design and Analysis of Computer Algorithms

(Formerly COMP 355)

Credit 3(3-0)

This course covers analysis of efficient algorithms for sorting, searching, dynamic structure manipulation, path-finding, fast multiplication, and other problems. It introduces algorithmic techniques such as recursion, divide-and-conquer, and dynamic programming. It develops tools for algorithmic analysis: correctness proofs, algorithm synthesis, and discusses issues in non computability. The course also overviews non-deterministic algorithms, and develops techniques to classify computationally hard problems. The concept of non-deterministic polynomial (NP)-completeness is introduced, and basic issues related to NP-completeness are discussed. Prerequisites: COMP 280, MATH 223, MATH 131.

COMP-300. Computer Science Colloquium 5 **Credit 0**

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Junior standing.

COMP-301. Computer Science Colloquium 6 **Credit 0**

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Junior standing.

**COMP-360. Programming Languages (Formerly:
COMP 465-Principles of Programming Languages)** **Credit 3(3-0)**

This course focuses on formal specification of programming languages, including definition of syntax and semantics: simple statements including precedence, infix, prefix, and postfix notations. It highlights global properties of algorithmic languages including sequence control, data structure implementation, scoping, storage management, grouping of statements, binding time, sub-routines, co-routines, and tasks. Prerequisite: COMP 285.

**COMP-363. Object Oriented Programming (Formerly:
COMP 495-Programming in C)** **Credit 3(3-0)**

This is a course in object oriented program development. The main topics include encapsulation, polymorphism, inheritance, debugging and performance tuning. A team programming project is required. Prerequisite: COMP 280.

**COMP-366. Electronic Data Processing (Formerly:
COMP 385-System Analysis and Design using COBOL)** **Credit 3(3-0)**

This course covers fundamentals of programming in business and commercial environments. Course topics include rudiments of systems analysis and design, data validation, level control, and sequential file processing. Prerequisite: COMP 280.

**COMP-370. Assembly Language Programming
(Formerly: COMP 470)** **Credit 3(3-0)**

This is a course on assembly level machine organization. The course covers computer organization and its effects on computer software, and assembly language translation. It stresses the linkage between assembler and high-level languages. Macro instructions, subroutines, and other fundamental assembly language concepts are also covered. Prerequisite: COMP 280.

**COMP-375. Computer Architecture and Organization
(Formerly: COMP-475-Switching Theory
and Computer Organization)** **Credit 3(3-0)**

This is an introduction to the internal architecture and design of computer systems. Topics include central processing unit architecture, microcode, system interconnections, memory systems, Input/Output systems, interrupt handling, switching theory, peripherals and communication networks. Prerequisite: COMP 370.

**COMP-385. Theory of Computing (Formerly:
COMP 585-Theoretical Aspects of Computing)** **Credit 3(3-0)**

Topics include theory of finite state machine and automata; regular expressions; Turing machines; grammars; parsing; language hierarchy; machine design and construction; computability; unsolvability; halting problem; computational complexity; and recursive functions. The course also discusses issues in equivalence of various computational models, minimization, and characterizations. Prerequisite: COMP 360.

COMP-390. Social Implications of Computing **Credit 3(3-0)**

This course examines the increasingly complex interaction between computer systems, our social fabric and ethics. Software and microprocessors control automobiles, banks, brokerage trading, aircraft, medical equipment, and just about every other device used in industrialized nations. Impacts of computerized systems upon personal privacy and citizen

involvement in governance are examined in relation to the public policy questions of the day. The role and opportunity for historically underrepresented groups will be explored. Interdisciplinary readings are stressed, along with required written and oral presentations and class debates. Prerequisites: ENGL 331, Junior standing, Computer Science Major.

COMP-397. Co-operative Industrial Experience I **Credit 3(3-0)**

This is a supervised learning experience in an approved private or governmental facility. The student must be employed full time for at least one semester and must perform supervised work that will enhance his/her educational background in an area related to computer science. In addition to the supervisor's evaluation in the field, the student's performance will be evaluated by a departmental faculty committee, based upon the recommendation of the Director of the Co-operative Education Program, reports, informal portfolios and forum and/or seminar presented by the student upon his/her return to the university. Prerequisite: Permission of Advisor.

COMP-398. Co-operative Industrial Experience II **Credit 3(3-0)**

This is a supervised learning experience in an approved private or governmental facility. The student must be employed full time for at least one semester and must perform supervised work that will enhance his/her educational background in an area related to computer science. In addition to the supervisor's evaluation in the field, the student's performance will be evaluated by a departmental faculty committee, based upon the recommendation of the Director of the Co-operative Education program, reports, informal portfolios and forum and/or a seminar presented by the student upon his/her return to the university. Prerequisite: COMP 397.

COMP-400. Computer Science Colloquium 7 **Credit 0**

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Senior standing.

COMP-401. Computer Science Colloquium 8 **Credit 0**

This course provides the student with exposure to current issues in computer science. Colloquium speakers shall include visitors and faculty. Prerequisite: Senior standing.

COMP-445. An Introduction to Artificial Intelligence **Credit 3(3-0)**

This course is an introduction to the theory of artificial intelligence and a survey of artificial intelligence application areas. This course covers the foundational concepts related to knowledge representation and search strategies. An artificial intelligence language is presented to give programming experience in implementing basic artificial intelligence concepts. Some of the applications areas that are discussed include: game playing, expert systems, theorem proving, natural language understanding, machine learning, planning, and robotics, Prerequisites: COMP 285, MATH 223.

**COMP-450. Operating Systems (Formerly:
COMP 641-Operating Systems)** **Credit 3(3-0)**

This is an introduction to the theory and practice of operating system design and implementation. Algorithmic techniques are presented for implementing process management, storage management, processor management, file systems, security, distributed systems, performance evaluation, and real time systems. Prerequisite: COMP 375.

**COMP-466. Systems Programming (Formerly:
COMP 560-Systems Programming)** **Credit 3(3-0)**

This course focuses on the principles underlying the design and implementation of vendor supplied operating systems, assemblers, compilers, and editors. It examines issues in basic software, firmware, and hardware components of computer systems. It also explores systems programming problems. Prerequisite: COMP 375.

COMP-467. Data Base Design (Formerly:**COMP 570-Data Base Design)****Credit 3(3-0)**

This course focuses on logical and physical organizations of large sets of related data. It covers issues in file structures as well as file and database management systems. It explores relational models, hierarchical models, directed graph models, data definition and manipulation languages, and relational calculus. Application oriented projects are required.

COMP-490. Program Design and Analysis in Ada**Credit 3(3-0)**

This course presents a comprehensive overview of the Ada programming language: Data types, program and software design using libraries, private types, generics, exception handling, and parallel processing. Prerequisite: COMP 285.

COMP-510. Software Engineering (Formerly:**COMP 649-Software Engineering)****Credit 3(3-0)**

This course is an introduction to the principles underlying software specification, implementation, validation, and management. The course addresses application of software engineering concepts to large software systems. Team effort is emphasized throughout the course. Prerequisite: COMP 360.

COMP-590. Special Topics in Computer Science**Credit 3(3-0)**

This course permits the exploration of advanced topics pertinent to student's program of study in a seminar setting. Prerequisite: Permission of Advisor.

COMP-600. Special Topics in Computer Science**Credit 3(3-0)**

This is a seminar surveying fundamental concepts and current ideas in computer science. The course shall be administrated by a faculty team employing a cooperative teaching paradigm. Students shall select, research, and present topics of their interest.

COMP-645. Artificial Intelligence**Credit 3(3-0)**

This course presents the theory artificial intelligence, and application of the principles of artificial intelligence to problems that cannot be solved, or cannot be solved efficiently, by standard algorithmic techniques. Knowledge representation, and Knowledge-based systems. Topics include search strategies, production systems, heuristic search, expert systems, inference rules, computational logic, natural language processing. Predicate calculus is discussed. An artificial intelligence language is presented as a vehicle for implementing concepts of artificial intelligence. Prerequisite: COMP 285 (Algorithms).

COMP-650. Advanced Operating Systems**Credit 3(3-0)**

This course centers on operating systems for multi-processing environments: concurrent processes, mutual exclusion, job scheduling, memory, storage hierarchy, file systems, security, and distributed processing. Also discussed are virtual resource management strategies. A design project involving the construction of operating facilities is produced.

COMP-653. Computer Graphics**Credit 3(3-0)**

This is a course in fundamental principles and methods in the design, use, and understanding of computer graphic systems. Topics include coordinate representations, graphics functions, and software standards. Hardware and software components of computer graphics are discussed. The course presents graphics algorithms. It also introduces basic two-dimensional transformations, reflection, shear; windowing concepts, clipping algorithms, window-to-viewpoint transformations, segment concept, files, attributes and multiple workstation, and interactive picture-construction techniques. Prerequisite: COMP-285 (Algorithms) and MATH 350 (Linear Algebra).

COMP-663. Principles of Compiler Design**Credit 3(3-0)**

This course emphasizes the theoretical and practical aspect of constructing compilers for computer programming languages. The course covers principles, models, techniques used in the design and implementation of compilers, interpreters, and assemblers. Topics include lexical analysis, parsing arithmetic expressions and simple statements, syntax specification, algorithms for syntax analysis, object code generation, and code optimization. Each student will develop and implement a compiler. Prerequisites: COMP-375 (Computer Architecture), COMP-385 (Theory of Computing).

COMP-670. Advanced Computer Architecture**Credit 3(3-0)**

This is a course which examines the control and storage structures which facilitate the execution and management of logically segmented programs and data. Of special focus are input output mechanisms, performance tuning, and microprogramming.

COMP-675. Computer Network Architecture

This is a course in the architecture of computer communication networks and the hardware and software required to implement the protocols that define the architecture. Basic communication theory, transmission technology, private and common carrier facilities, international standards, satellite communications, and local area networks are examined. Methods of performance analysis and communication network modeling is discussed.

COMP-681. Formal Methods**Credit 3(3-0)**

In this course, formal methods that model the software development process will be studied. Fundamental and practical methodologies and theories, including set theory and the foundations of software engineering will be emphasized. Applications to formal specifications, object-oriented programming and data modeling will be examined. Topics include: set theory, relations and functions, induction and recursion, symbolic logic, complex models, and application case studies. Prerequisites: Graduate or Senior standing.

COMP-685. Advanced Analysis of Algorithms**Credit 3(3-0)**

This course discusses the design and analysis of efficient algorithms and algorithmic paradigms. Applications include sorting, searching dynamic structures, graph algorithms, computationally hard problems, and NP completeness.

COMP-695. Information, Privacy and Security**Credit 3(3-0)**

This course examines the security and privacy issues associated with informational systems. There are cost/risk tradeoffs to be made. Discussed are topics such as technical, physical, and administrative methods of providing security, access control, identification, and authentication. Encryption is examined, including Data Encryption Standards (DES) and public key crypto-systems. Management considerations such as key protection and distribution, orange book requirements, and OSI data security standards are covered. Privacy legislation is covered, as is current cryptographic research.

Courses open only to Graduate Students (700+ level)

DIRECTORY OF FACULTY

Joseph Monroe, B.S., North Carolina A&T State University; M.S., Ph.D., Texas A&M University; Ronald McNair Chair, Professor and Interim Chairperson

David Bellin, B.A., University of Saskatchewan (Canada); M.S., Polytechnic Institute of New York, Ph.D., City University of New York; Associate Professor

Salman Azhar, B.S., Wake Forest University; M.S., Ph.D., Duke University; Assistant Professor

Albert Esterline, B.A., Lawrence University; M.Litt., Ph.D., University of St. Andrews (Scotland); Ph.D., University of Minnesota; Assistant Professor

David Goldstein, B.S., Temple University; M.S., University of Pennsylvania; Ph.D., University of Texas-Arlington, Assistant Professor

Dechang Gu, B.S., Hefei Polytechnic University; M.E., Chinese Academy of Science; M.S., Ph.D., State University of New York at Albany; Ph.D., State University of New York at Albany; Assistant Professor

Kenneth A. Williams, B.S., M.S., Michigan Technological University; Ph.D., University of Minnesota, Assistant Professor

Anna Yu, B.S., Xiamen University; M.S., Hefei Polytechnic University; Ph.D., Stevens Institute of Technology; Assistant Professor

Shearon A. Brown, B.S., M.S., North Carolina A&T State University; M.S., University of Illinois, Adjunct Assistant Professor

Martha L. Haigler, B.S., Fayetteville State University; M.S., Stevens Institute of Technology; Adjunct Assistant Professor

Rodney E. Harrigan, B.S., Paine College; M.S., Howard University; Adjunct Associate Professor

Department of Electrical Engineering

Dr. Gary Lebby, Chairperson

OBJECTIVES

The objectives of the Department of Electrical Engineering are to provide the opportunity for its students to acquire the educational background necessary to pursue professional careers in electrical engineering or to continue their education toward advanced degrees. The primary purpose of the department is to teach technical topics related to the field of electrical and computer engineering. A comprehensive engineering design experience is an integral part of the total undergraduate electrical engineering educational programs.

DEGREES OFFERED

Electrical Engineering - Bachelor of Science

*Electrical Engineering - Master of Science

*Engineering - Master of Science

*Electrical Engineering - Doctor of Philosophy

**See the Graduate School Bulletin.*

GENERAL PROGRAM REQUIREMENTS

See College of Engineering Undergraduate Admission policy statement. For graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENT DEGREE REQUIREMENTS

Electrical Engineering Major (B.S. degree)—The major in electrical engineering must complete a minimum of 124 credit hours for the Bachelor of Science Degree.

While changes in requirements for the B.S. degree may occur at anytime, a student is given the option of graduating under the curriculum in force when the student entered the program or graduating under the new program.

ACCREDITATION

The undergraduate program in electrical engineering, leading to the B.S.E.E. degree, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

CAREER OPPORTUNITIES

A degree in this field prepares a student for careers in Computer Engineering, Engineering Design, Electronics, Communications, Power Engineering and Signal Processing, or for graduate study in electrical or computer engineering.

CURRICULUM GUIDE FOR ELECTRICAL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
ENGL 100	3	ENGL 101	3
MATH 131	4	MATH 132	4
Soc. Sci. Elective	3	CHEM 101	3
History Elective	3	CHEM 111	1
GEEN 100	2	Global Studies	3
GEEN 101	<u>2</u>	GEEN 102	<u>2</u>
	17		16

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 331	3	MATH 231	4
PHYS 241	3	PHYS 242	3
PHYS 251	1	PHYS 252	1
ELEN 200	3	ELEN 300	3
ELEN 206	1	ELEN 306	1
INEN 260	2	ELEN 327	<u>3</u>
PHED Elective	<u>2</u>		15
	15		

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 332	3	ELEN 400	3
ELEN 320	3	ELEN 460	3
ELEN 427	3	ELEN 466	1
ELEN 433	1	*ELEN Elective I	3
ELEN 325	3	MEEN 337	3
MEEN 335	<u>3</u>	ELEN 430	3
	16	ELEN 436	<u>1</u>
			17

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH (Adv.) Elective	3	ELEN (6XX) Adv Engr. Elect.	3
*ELEN Elective II	3	ELEN (6XX) Adv Engr. Elect. Lab	2
Eng. Sci. Elect.	3	ECON 300	3
ELEN (6XX) Adv. Elective	3	HUMN. Elective	3
Black Studies	3	Free Elective	2
	<hr/> 15		<hr/> 13

Total Credit Hours: 124

*EE Electives I

ELEN 410 Linear Sys & Ctrl

ELEN 420 Power Electronics

*EE Electives II

ELEN 450 Prin of EM Waves II

ELEN 470 Properties of Materials for EE

COURSES WITH DESCRIPTION IN ELECTRICAL ENGINEERING

ELEN-200. Electric Circuit Analysis **Credit 3(3-0)**

Resistive circuit analysis, application of Kirchoff's Laws, Loop and Nodal Analysis, Thevenins, and Nortons, etc., to resistive circuits with DC sources; also transient and steady state solutions to first and second order linear systems in the time and frequency domains. Prerequisite: GEEN 102. Corequisite: MATH 231.

ELEN-206. Circuits Laboratory I **Credit 1(0-3)**

The proper use of laboratory instrumentation, principles of measurements, experimental verification of electrical circuit laws and theorems, transient and steady state response of systems with linear passive elements; use of the computer and engineering software packages. Prerequisite: GEEN-101. Corequisite: ELEN-200.

ELEN-300. Electric Circuit Analysis and Synthesis **Credit 3(3-0)**

Periodic function analysis on nth order linear systems, Fourier Series and Laplace Transform techniques, and introductory synthesis techniques with coordinated laboratory work. Prerequisite: ELEN 200. Corequisite: MATH 331.

ELEN-306. Circuits Laboratory II **Credit 1(0-3)**

Analysis of linear networks and signals using frequency domain techniques. Computer and theoretical analysis of networks are compared with laboratory experimental results using actual circuits. Prerequisites: ELEN 200, 206. Corequisite: ELEN 300.

ELEN-320. Electronics I **Credit 3(3-0)**

A study of active devices with emphasis on terminal behavior. Physical electronics, linear and nonlinear modeling. Coordinated laboratory work. Prerequisite: ELEN 200. Corequisite: MATH 331.

ELEN-325. Introduction to Electromagnetics **Credit 3(3-0)**

Electromagnetic concepts and effects using vector analysis. Corequisite: MATH 332, ELEN 300.

ELEN-326. Electronics I Laboratory **Credit 1(0-3)**

Design and analysis of semiconductor electronic circuits using discrete active elements. Emphasis is on physical electronics, terminal behavior, small signal modeling, biasing, ampli-

fier design and analysis of frequency response with experimental verification. Prerequisites: ELEN 200 and ELEN 206. Corequisites: MATH 331 and ELEN 320.

ELEN-327. Digital Logic

Credit 3(3-0)

Study of Boolean algebra; techniques for design and optimization of combinational logic design, flipflops, counters, registers and arithmetic concepts necessary to understand computer logic. Prerequisite: ELEN 200.

ELEN-400. Digital Signals Analysis and Processing

Credit 3(3-0)

Analysis of system responses to signals using convolution, Fourier integral spectral sampling, correlation, and probabilistic techniques. Prerequisite: ELEN 300.

ELEN-410. Linear Systems and Control

Credit 3(3-0)

Introduction to control theory. This includes: control system modeling and representation, features of feedback control systems, state space representation, time domain analysis, stability analysis, root locus, and design compensation. Prerequisite: ELEN 300.

ELEN-420. Power Electronics

Credit 3(3-0)

Introduction to power semiconductor devices, naturally commutating converters A.C. regulators, D.C switching regulators, static power inverters, and application techniques. Prerequisite: ELEN 320.

ELEN-427. Introduction to Microprocessors

Credit 3(3-0)

An introduction to microprocessor hardware and software design assembly language and machine language programming and microprocessor interfacing and applications. Prerequisite: ELEN 327.

ELEN-433. Digital Systems Laboratory

Credit 1(0-3)

Practical experience in the design, construction and analysis of logic circuits. Prerequisite: ELEN 327. Corequisite: ELEN 427.

ELEN-436. Power Systems, Energy Conversion and Electric Machinery Laboratory

Credit 1(0-3)

A study of power circuits and a study of the behavior of motors and generators by laboratory experimentation. Prerequisites: E.E. 300, ELEN 306, ELEN 325. Corequisite: ELEN 430.

ELEN-442. Electrical Engineering Survey

Credit 3(3-0)

Electronic circuit theory and applications; control of electrical apparatus; electro-chemical processes; electronic analog and digital computer principles. Coordinated laboratory work. Prerequisite: ELEN 200.

ELEN-450. Principles of Electromagnetic Waves

Credit 3(3-0)

The basic postulates of electromagnetism; the integral laws of free space; the differential laws in free space; static fields; time varying fields. Prerequisite: ELEN 325.

ELEN-460. Electronics II

Credit 3(3-0)

A continuation of Electronics I, Principles of semiconductor electronic circuits; rectifiers and filters; amplifiers; feed-back and oscillatory systems. Coordinated laboratory work. Prerequisite: ELEN 320.

ELEN-466. Electronics II Laboratory

Credit 1(0-3)

Design analysis of semiconductor electronic circuits using discrete and integrated circuits. Emphasis is on design and experimental verification of amplifiers, switching circuits, etc. using linear active devices. Prerequisites: ELEN 320 and ELEN 320. Corequisite: ELEN 460.

ELEN-470. Properties of Materials for Electrical Engineering

Credit 3(3-0)

The effects of atomic, molecular, and crystal structure on the electrical and physical properties of conducting, insulating and semiconductor materials used in electrical engineering. Prerequisite: ELEN 325.

Advanced Undergraduate

ELEN-602. Semiconductor Theory & Devices

Credit 3(3-0)

A study of the phenomena of solid-state conduction and devices using band models; excess carriers in semiconductors; p-n junctions and devices; bipolar junction transistors field effect transistors; integrated circuits. Prerequisites: PHYS 406 and ELEN 460.

ELEN-614. Integrated Circuit Fabrication Methods

Credit 3(3-0)

Device technology for the fabrication of silicon integrated circuits. Techniques will be applicable to bipolar and MOS transistor structures, LSI and VLSI circuits. Oxidation, diffusion, epitaxy and ion implantation processes will be studied. Limits on device design and performance; compound semiconductor device technology. Prerequisite: ELEN 602 or consent of instructor.

ELEN-615. Silicon Device Fabrication Laboratory

Credit 2(0-2)

Laboratory experiments in the fabrication of silicon devices. P-N junctions diodes, metal-oxide semiconductor (MOS) field effect transistors will be fabricated. Oxidation, diffusion and photolithographic techniques will be presented. Prerequisite: ELEN 614 or consent of instructor.

ELEN-616. Microprocessor Software Design

Credit 3(3-0)

An introduction to microprocessor systems with emphasis on software design. A popular microprocessor system will be used as the basis for the course. Programming techniques that lead to error free programs using assembly language will be emphasized. Prerequisite: ELEN 427.

ELEN-617. Microprocessor Hardware Design

Credit 3(3-0)

Microprocessor architectures and supporting components RAMS, ROMS, PORTS, timers, etc. are studied. I/O structures in microcomputers, interrupts, DMA operations and interfacing problems are also addressed. Emphasis will be placed on microcomputer development from the device to the system level. Prerequisite: ELEN 427.

ELEN-619. Micorprocessor Laboratory

Credit 2(0-2)

Experiments are geared to provide students with practical understanding of microprocessor systems design techniques, including memory, I/O interfacing interrupts and DMA operations. A student project provides an opportunity for students to gain experience in using the microcomputer in typical applications in process control, test equipment communication, etc. Prerequisite: ELEN 427. Corequisite: ELEN 617 or consent of instructor.

ELEN-627. Switching Theory

Credit 3(3-0)

A study of design techniques for systems at the gate and flip flop level with applications to both combinational and sequential logic circuits. Functional minimization and state minimization algorithms, timing problems, and state assignment are dciscussed. MSI and LSI circuits are also discussed. Prerequisite: ELEN 427.

ELEN-629. VLSI Design

Credit 3(3-0)

A study of the principles for designing large scale integrated systems. Emphasis is placed upon implementation of combinational logic and sequential machines as regular structures such as PLA's and iterative networks. CAD techniques and circuit simulation methods are discussed. MOS devices and their properties are also studied. Prerequisite: ELEN 627.

ELEN-630. VLSI Design Lab

Credit 2(0-2)

To familarize the student with various CAD tools that are essential for integrated circuit design and verification. These tools include geometric pattern generators, design rule checkers, circuit simulators, and PLA generators. A student project is part of the laboratory requirements. Prerequisite: ELEN 627. Corequisite: ELEN 629.

- ELEN-633. Digital Electronics** **Credit 3(3-0)**
Families of logic; resistor-transistor logic (RTL), integrated-injection logic (IIL), diode-transistor logic (DTL), transistor-transistor logic (TTL), emittercoupled logic (ECL), MOS gates and CMOS gates. Basic digital structures; flipflops, registers and counters, interface between digital and analog signals. Prerequisite: ELEN 460.
- ELEN-636. Balanced Power Systems at Steady State** **Credit 3(3-0)**
General background in power systems transmission line parameters, current voltage regulations on a transmission line, system modeling, network calculations, load flow studies and control. Prerequisite: ELEN 430.
- ELEN-637. Unbalanced Power Systems at Steady State** **Credit 3(3-0)**
Economic operation of power systems, fault studies, symmetrical components, and power system protection. Prerequisite: ELEN 430.
- ELEN-638. Power Systems Lab** **Credit 2(0-2)**
Transmission Lines: parameters, short, medium and long line models, voltage regulators, power flow, series and parallel reactive compensation. Transient analysis. Network reduction techniques and computer solution to load flow problems. Prerequisite: ELEN 436. Corequisite: ELEN 636 or ELEN 637.
- ELEN-642. Solid State Energy Conversiton** **Credit 3(3-0)**
Review of semi-conductor and solar radiation principles. Operation and design of solid state thermoelectric generators. Operation and design of solar ccess. Use of solar collectors and solar cells in terrestrial applications. Prerequisites: PHYS 406 and ELEN 460 or consent of instructor.
- ELEN-647. Introduction to Telecommunications Networks** **Credit 3(3-0)**
Familiarization with open Systems Interconnection standards for data network. Introduction to data networks architectures and protocols.
- ELEN-649. Modulation Theory & Communication Systems** **Credit 3(3-0)**
Fundamental principles of modulation theory applied to amplitude, single and double side band, frequency, pulse amplitude, pulse duration, pulse code and multiplexing modulation methods and their application to communication systems are studied. Random signals, noise considerations and probability theory are introduced. Prerequisites: ELEN 300, ELEN 320, and MATH 500.
- ELEN-650. Digital Signal Processing I** **Credit 3(3-0)**
Develop working knowledge of basic signal processing functions such as digital filtering, spectral analysis, and detection/-post detection processing. Methods of generating the coefficients of the digital filters will be derived. Alternative structures for filters such as indefinite impulse response and finite impulse response will be compared. The effect of finite register length will be covered
- ELEN-651. Digital Signal Processing Laboratory** **Credit 2(0-3)**
Experiments and students projects related to the practical application of digital signal processing techniques for data acquisition, digital filtering, control, spectral analysis, communications, etc. Prerequisite: ELEN 400. Corequisite: ELEN 650.
- ELEN-656. Probability & Random Processing** **Credit 3(3-0)**
Sample space and events, conditional probabilities, independent events, Bayes' formula, discrete random variable, continuous random variable, expectation of random variable, joint distribution, conditional expectation, Markov chains, stationary processes, ergodicity, correlation and power spectrum of stationary processes. Poisson processes. Gaussian processes. Prerequisite: ELEN 400.

ELEN-660. Selected Topics in Engineering**Credit Variable (1-3)**

Selected engineering topics of interest to students and faculty. The topics will be selected before the beginning of the course and will be pertinent to the programs of the students enrolled. Prerequisite: Consent of instructor.

ELEN-666. Special Projects**Credit Variable (1-3)**

Study arranged on a special engineering topic of interest to student and faculty member, who will act as advisor. Topics may be analytical and/or experimental and encourage independent study. Prerequisite: Consent of instructor.

ELEN-668. Automatic Control Theory**Credit Variable (1-3)**

The automatic control problem; review of operational calculus; state and transient solutions of feedback control systems; types of servo-mechanisms and control systems; design principles. Prerequisite: ELEN 410 or equivalent.

ELEN-672. Analog Electronics**Credit 3(3-0)**

Circuits and systems of linear electronics studied. Design techniques for linear integrated circuits technology are emphasized. Core topics include: Operational amplifiers, A/D and D/A converters, function generator and voltage regulators. Selected topics on : Feedback amplifier, oscillators, PLL (Phase Locked Loop), consumer electronics, noise. Prerequisite: ELEN 460.

ELEN-674. Network Synthesis**Credit 3(3-0)**

Use of positive real functions in the synthesis of passive networks. Properties of second order systems and their realization; control of poles and zeros through dependent sources. Synthesis and analysis of active and passive filters. Prerequisites: ELEN 300, ELEN 460.

ELEN-678. Projects in Electronic Network & Systems**Credit 3(3-0)**

Laboratory of special interest to students in electronic network and systems; students will be required to do projects emphasizing actual circuit construction and systems integration. Corequisite: ELEN 633.

DIRECTORY OF FACULTY

Fadi Busaba, B.E., American University of Beirut; M.S.E.E., North Carolina Agricultural and Technical State University; Ph.D., North Carolina State University, Raleigh; Assistant Professor

Ali Abul-Fadl, B.S., M.S., Ph.D., University of Idaho; Associate Professor

Ward J. Collis, B.S., M.S., Northwestern University; Ph.D., Ohio State University; Associate Professor

Abdollah Homaifar, B.S., M.S., State University of New York-Stony Brook; Ph.D., University of Alabama; Assistant Professor

Shanthi Iyer, B.S., M.S., Delhi University; Ph.D., Indian Institute of Technology; Associate Professor

John Kelly, B.S., Ph.D., University of Delaware; Associate Professor and Associate Dean

Jung Kim, B.S., Yonsei University, M.S., Ph.D., North Carolina State University; Associate Professor

Parag Lala, M.S., University of Karachi; M.S.E., King's College of London; Ph.D., The City University of London; Research Professor

Gary Lebby, B.S., M.S., University of South Carolina, Ph.D., Clemson University; Associate Professor, Chairperson

Clinton Lee, B.S., California Institute of Technology; M.S., North Carolina A&T State University; Ph.D., North Carolina State University; Assistant Professor

Robert Li, B.S., in Electrical Engineering, Duke University; M.S., in Electrical Engineering, Purdue University; Ph.D., in Electrical Engineering, University of Kansas; Associate Professor.

Harold Martin, B.S., M.S., North Carolina A&T State University; Ph.D., Virginia Technical University; Professor

Tony L. Mitchell, B.S., North Carolina A&T State University; M.S., Georgia Institute of Technology; Ph.D., North Carolina State University; Professor

David Olson, B.S., M.E., Michigan Technological University; Ph.D., University of Utah; Associate Professor

Dr. Y-D Song, B.S., (E.E.), ChengDu University of Science and Technology, P.R. China; M.S., (E.E.), ChongQuing University, P.R. China; Ph.D., (E.E.), Tennessee Technological University; Assistant Professor

Earnest E. Sherrod, B.S., North Carolina A&T State University; M.S., Newark College of Engineering; Associate Professor

F. S. Vainstein, B.S., M.S., Moscow Institute of Electronics; Ph.D., Boston University; Associate Professor

Alvernon Walker, BSEE, MSEE, North Carolina A&T University; Ph.D., North Carolina State Univ.; Assistant Professor

Chung Yu, B.Eng., McGill University; M.S., Ph.D., Ohio State University; Professor

Department of Industrial Engineering

Eui H. Park, Chairperson

OBJECTIVES

The main objective of the Department of Industrial Engineering is to provide quality educational programs leading to baccalaureate and post-baccalaureate degrees. The curriculum is designed to educate engineers that are needed to fill technical and managerial positions in manufacturing, service, and government.

The Department of Industrial Engineering offers programs of study that strongly emphasize general engineering and humanistic topics. Major courses in Industrial Engineering are offered that integrate the use of computers to aid in the solution of problems. Another major focus in Industrial Engineering is to blend human elements into the total product/service delivery system. The curriculum focuses more attention on the human-machine interface than other engineering fields. Additionally, principles of business, economics and accounting are blended into the curriculum to provide a foundation for graduates who seek advancement into managerial positions.

Specific objectives are:

1. To provide an undergraduate education that will prepare students for challenging technical and managerial positions in industry and government.
2. To provide an education that will give the background and motivation necessary for post-baccalaureate study in Industrial Engineering.
3. To prepare technically competent, responsible, socially-conscious, and productive professionals in the field of Industrial Engineering.

The Institute of Industrial Engineers defines the discipline as follows:

Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment and energy. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.

DEGREES OFFERED

Industrial Engineering - Bachelor of Science

*Industrial Engineering - Master of Science

*Engineering - Master of Science

**See the Graduate School Bulletin.*

GENERAL PROGRAM REQUIREMENTS

See the School of Engineering Undergraduate Admission policy statement. For graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENTAL REQUIREMENTS

A total of 128 semester hours credit are required for graduation. There are 102 hours of specific required courses. Additionally, there are 12 hours of humanities/social science electives, 6 hours of technical electives, 6 hours of mechanical engineering electives, and 2 hours of Physical Education electives. Course substitutions for the 102 hours of specific required courses must be approved by the student's advisor and department chairperson.

ACCREDITATION

The undergraduate program in Industrial Engineering, leading to the BSIE degree, is accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology.

CAREER OPPORTUNITIES

Industrial Engineering is one of the major engineering fields in the United States. Of all engineering fields, Industrial Engineering represents the one with the greatest unmet need. At present, the number of industrial engineering graduates produced each year represents one-third of the demand for industrial engineering graduates nationally. Starting salaries for industrial engineers are competitive with those of starting salary careers of Electrical, Mechanical, and Chemical Engineering. Due to the education industrial engineers receive and the type of experience they gain in industry, they often switch to management careers in five to ten years following graduation. Because of the volume of manufacturing and service organizations in North Carolina, and surrounding states as well, there is a considerable demand for industrial engineers.

CURRICULUM GUIDE FOR INDUSTRIAL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEEN 100	2	GEEN 102	2
ENGL 100	3	ENGL 101	3
MATH 131	4	MATH 132	4
GEEN 101	2	CHEM 101	3
Humanities Elective @	3	CHEM 111	1
PHED Elective	2	Humanities Elective @	3
	<u>16</u>		<u>16</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
PHYS 241	3	INEN 200	3
PHYS 251	1	INEN 240	2
MATH 231	4	INEN 245	1
ECON 300	3	PHYS 242	3
MEEN 260	2	PHYS 252	1
MATH 242	3	MATH 331	3
INEN 260	2	INEN 210	3
	<u>18</u>		<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
INEN 255	3	INEN 355	3
INEN 310	3	INEN 365	3
ELEN 200	3	INEN 420	3
MEEN 335	3	ECON 301	3
INEN 360	3	MEEN XXX *	3
INEN 325	3		<u>15</u>
	<u>18</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
INEN 400	3	INEN 495	2
INEN 410	3	INEN 489 **	3
INEN 490	2	INEN 624	3
INEN 6XX	3	INEN 6XX	3
MEEN XXX *	3	Social Science Elective @	1
Social Science Elective @	3		<u>12</u>
	<u>17</u>		

Total Credit Hours: 128

@ Note: Black/Global Studies Requirement

* MEEN XXX: Select two from MEEN 336, 337, 441

** Substitution by GEEN 500 is allowed.

COURSES WITH DESCRIPTION IN INDUSTRIAL ENGINEERING

Undergraduate

INEN-200. Engineering Statistics **Credit 3(3-0)**
Introduction to the principles and methodologies of statistical inference, statistical application to engineering, and analysis of variance. Use of statistical analysis software. Prerequisites: MATH 132, MATH 224.

INEN-210. Decision Support Systems-I **Credit 3(2-2)**
This course introduces computer spreadsheets. Application in data plotting and analysis, numerical methods, and database management are explored. Projects involving industrial engineering case studies are emphasized. Prerequisite: GEEN 102.

INEN-240. Industrial Production and Process Design **Credit 2(2-0)**
This course covers planning theory and transformation processes used in discrete parts production environment. Major topics covered include process planning, materials processing, inspection, electronics manufacturing and the necessary tooling associated with these topical areas. Prerequisite: MEEN 260.

INEN-245. Industrial Production and Process Design Lab **Credit 1(0-2)**
Hands on experience is given in the application of the concepts covered in INEN 240. Laboratory exercise focus on the design of production processes and shop floor production experience. Prerequisite: MEEN 260.

INEN-255. Methods Engineering **Credit 3(3-0)**
This course introduces the measurement of human performance which is done to justify alternative designs through the use of time motion study and work design techniques. Task analysis, direct observation, questionnaire design, occurrence sampling, classical work measurement, predetermined motion time systems and anthropometry are the techniques used. Laboratory projects are required. Prerequisites: INEN 240 & MATH 224.

INEN-260. Engineering Economic Analysis **Credit 2(2-0)**
This course provides a sound understanding of basic concepts in compound interest and its applications in engineering problems. Methods of comparative economic analysis such as annual cost, present worth and rate of return are discussed. Depreciation, replacement, tax effects and sensitivity analysis are discussed. Prerequisite: MATH 131.

INEN-310. Operations Research-I **Credit 3(3-0)**
Deterministic models and computer applications of operations research are discussed with special emphasis on linear programming. Topics covered include simplex algorithm, transportation and nonlinear programming models. Applications in engineering and management are emphasized. Prerequisite: MATH 231.

INEN-325. Quality Control **Credit 3(3-0)**
The most important statistical Quality Control tools are investigated. These include control charts, attributes and variable sampling plans, and reliability analyses. Each student must design a useful project where data collections. Prerequisite: INEN 200.

INEN-355. Production Control **Credit 3(3-0)**
This is a study of production and operations techniques including forecasting, inventory control, project planning, scheduling, line balancing, Just-in-Time and Kanban concepts. The integration of concepts is accomplished through a design project. Prerequisites: INEN 255, INEN 310.

INEN-360. Engineering Cost Management and Control **Credit 3(3-0)**

This course covers the use of cost information by engineers for the planning, organizing, and control of industrial operations. Methods for engineering cost estimation, cost control, life cycle costing and performance measurement will be studied. Case studies, design projects, and oral presentations are required. Prerequisite: INEN 260.

INEN-365. Facilities Design **Credit 3(2-2)**

Study of theory and practice of facilities design: activity and flow analysis, space requirement, layout techniques, material handling, warehousing, location selection, problem solving with computer-aided layout techniques. Design projects in plant layout required. Prerequisites: INEN 255 and INEN 310.

INEN-400. Introduction to Stochastic Process and Simulation **Credit 3(3-0)**

This course covers the basic concepts of stochastic processes and simulation, including Poisson process, inventory, reliability and queueing models, discrete event simulation modeling, random number generation, model validation and result interpretation. Design projects on the use of simulation for alternative design of production systems are required. Prerequisites: MATH 224 and Junior standing.

INEN-410. Automated Production Systems-I **Credit 3(2-2)**

Study of modern production systems; principles, theories, and practical applications of integrated manufacturing systems. Introduction to numerical control methods, industrial robots, and group technology. Analysis and design of manufacturing support systems. Laboratory projects in designing economic production systems required. Prerequisite: INEN 355.

INEN-420. Industrial Ergonomics **Credit 3(2-2)**

This course introduces students to the functional processes of human systems that pertain to the limitations of humans in man-machine systems. The areas of study are physiology, ergonomics and safety in the context of measuring and predicting human performance. Principles are applied through design problems and laboratory demonstrations. Laboratory projects examining physiological and psychological measures of human performance are required. Prerequisites: INEN 200 and INEN 255.

INEN-489. Industrial Engineering Seminars **Credit 1(0-2)**

A series of seminars illustrating safety, health and welfare of the public in the performance of an engineer's professional duties are presented. Prerequisite: Senior standing.

INEN-490. Design Projects in Industrial Engineering-I **Credit 2(0-4)**

This course introduces the students to real-life examples in the design of productive systems. The students learn, through open-ended case studies, the process of design as a problem solving and iterative decision making process. Fundamental elements of systems methodology, analysis design, and synthesis are discussed. The students work on group projects that test their design creativity. Prerequisites: INEN 265, INEN 355. Corequisites: INEN 400, INEN 410.

INEN-495. Design Projects in Industrial Engineering-II **Credit 2(0-4)**

The students work on a real-life design project from the industry. The project requires the students to analyze, design, and recommend, through economic justification, the best design alternative. The students write a final engineering report on their design concepts that includes problem statements, design specifications, and analytical models used. The students demonstrate the feasibility of their designs through formal presentations which include design performance measures such as safety, aesthetics, reliability, cost, social and ethical values. Prerequisite: INEN 490.

INEN-615. Industrial Simulation**Credit 3(3-0)**

This course addresses simulation languages. One general simulation language is taught in depth. The use of simulation modeling in design and improvement of production and service is emphasized. Design projects are required. Prerequisite: INEN 400.

INEN-621. Engineering Cost Control and Analysis**Credit 3(3-0)**

This course is designed to emphasize the use of accounting data internally by engineers as a key participant in all functions of management. It focuses upon the systems design concepts in job order costing, process costing and Just-in-Time (JIT) inventory in manufacturing organizations. Design projects are required. Prerequisite: INEN 265.

INEN-624. Computer-Aided Design and Manufacturing**Credit 3(2-2)**

This course focuses on Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM) and their integration. Topics include numerical control, robotics, computer vision, and sensors. Topics in concurrent engineering are also addressed. Design projects are required. Prerequisite: INEN 410.

INEN-625. Advanced Decision Support Systems**Credit 3(3-0)**

This course introduces design implementation and evaluation of information systems. Structured analysis and design techniques, organization of data and current software tools are introduced. Current database technologies are presented. The role of information systems as an integration tool for manufacturing systems is also addressed. Design projects are required. Prerequisite: INEN 210.

INEN-626. Systems Analysis and Design**Credit 3(3-0)**

Analysis and development of systems, including management requirements, decision-making levels, economic justification, and implementation. The computer is considered as a tool in analysis and design as well as one component in the total system. Prerequisite: Graduate standing in engineering.

INEN-632. Robotic Systems and Applications**Credit 3(2-2)**

This course addresses applications and justification of robotics. Principal topics include anatomy and characteristics of robots, end effectors, vision systems, programming and application criteria for industrial robots. Design projects are required. Prerequisite: INEN 410.

INEN-635. Materials Handling Systems Design**Credit 3(2-2)**

This course focuses on design, and analysis of materials handling and flow in manufacturing facilities. Principles, functions, equipment and theoretical approaches in materials handling are discussed. Tools for the automation of materials handling are introduced. Design projects are required. Prerequisites: INEN 210 and INEN 365.

INEN-645. Advanced Facilities Design**Credit 3(2-2)**

This course focuses on modeling design and location and production facilities. Topics include computer simulation of production facilities, analytical models, location theory, workplace design and preventive maintenance. Design projects are required. Prerequisites: INEN 365 and INEN 400.

INEN-650. Probabilistic Models in Operations Research**Credit 3(3-0)**

This course covers an introduction to probabilistic operations research models and solution techniques. Specific topics covered include basic ideas of stochastic processes, Markov chains, queuing models and their applications, and decision analysis including Bayesian methods. Prerequisites: INEN 200 and INEN 400.

INEN-658. Project Management and Scheduling**Credit 3(3-0)**

Project scheduling is addressed using Critical Path Method (CPM) and Project Evaluation and Review Technique (PERT). Theory of scheduling is discussed. Applications in flow shops, job shops, cellular manufacturing and project environments are explored. Approaches used include mathematical optimization, heuristics, and simulation. Design projects are required. Prerequisite: INEN 310.

INEN-660. Selected Topics in Engineering**Credit Variable (1-3)**

Selected engineering topics of interest to students and faculty. The topics will be selected before the beginning of the course and will be pertinent to the programs of the students enrolled. Prerequisite: Consent of the instructor.

INEN-662. Reliability**Credit 3(3-0)**

This course reviews the statistical concepts and methods underlying procedures used in reliability engineering. Topics include the nature of reliability and maintenance, life failure and repair distributions, life test strategies, and complex system reliability including: series/parallel/standby components with preventive maintenance philosophy. Prerequisite: INEN 200.

INEN-664. Safety Engineering**Credit 3(3-0)**

This course addresses the history and legislation of the Occupational Safety and Health Act. The approach to accident causation is compared with task/operator/machine/environment. The methods of investigating and analyzing accidents and the design of safety programs and procedures are discussed. Design projects are required. Prerequisites: INEN 200 and INEN 420.

INEN-665. Human-Machine Systems**Credit 3(2-2)**

This course introduces behavioral and psychological factors such as sensory, perception and attention, decision making and cognitive processes. This course emphasizes the applications of these factors to the design and development of man-machine systems. Design projects are required. Prerequisite: INEN 420.

INEN-666. Special Projects**Credit Variable (1-3)**

Study arranged on a special engineering topic of interest to student and faculty member, who will act as advisor. Topics may be analytical and/or experimental and encourage independent study. Prerequisite: Consent of the instructor.

INEN-678. Engineering Management**Credit 3(3-0)**

A brief review of engineering management history and its relationship to industrial engineering, operations research, management science, and technical engineering disciplines. Planning, organizing, staffing, directing and controlling an engineering environment. Prerequisite: Senior standing in engineering or consent of the instructor.

DIRECTORY OF FACULTY

Ganella Grace, B.S., University of North Carolina; MSIE, North Carolina A&T State University; Ph.D., Virginia Polytechnic Institute; Assistant Professor

Arup Mallik, BSME, Jadavpur University, MSIE Ph.D., North Carolina State University; Professional Engineer; Professor

Lorace L. Massay, B.Sc., University of West Indies, Trinidad; M.Sc., Cranfield Institute of Technology Silsoe, England; Ph.D., University of Missouri-Rolla; Assistant Professor

Celestine Ntuen, NCE, CRS University; BSIE, MSIE, Ph.D., West Virginia University; Associate Professor

Eui Park, B.S., Yonsei University; MSIE, Ph.D., Mississippi State University; Professor and Chairperson

Barbara T. Piore, BASc, MASc, Ph.D. Candidate, University of Toronto; Research Associate

Bala Ram, BSME, MSIE, India Institute of Technology, Madras; Ph.D., State University of New York; Professional Engineer, Associate Professor

Sanjiv Sarin, BSChE, MSIE, Indian Institute of Technology, Delhi; Ph.D., State University of New York; Professional Engineer, Associate Professor

Silvanus J. Udoka, B.S., Weber State University, Ogden, UT, MSIE, Ph.D., Oklahoma State University; Assistant Professor

Charles Vandezande, B.Sc., Lawrence University; M.Sc., Rutgers University; Adjunct Associate Professor

Department of Mechanical Engineering

William J. Craft, Chairperson

OBJECTIVES

The major objective of the Baccalaureate program within The Department of Mechanical Engineering is the production of graduates who are technically competent and properly trained to pursue a successful career in the engineering profession. In fulfilling this major objective, the department seeks to develop in students an understanding of basic engineering, physical sciences, mathematics, analysis and synthesis, and creativity in solving engineering problems, to promote clear, logical thinking, to foster an understanding of the social and ethical implications of technical decisions, and to provide an environment conducive to professional growth and inquiry.

DEGREES OFFERED

Mechanical Engineering - Bachelor of Science

*Mechanical Engineering - Master of Science

*Engineering - Master of Science

*Mechanical Engineering - Doctor of Philosophy

*See the Graduate School Bulletin

GENERAL PROGRAM REQUIREMENTS

See College of Engineering Undergraduate Admission policy statement. For Graduate degree admission requirements see the Graduate School Bulletin.

DEPARTMENTAL REQUIREMENTS

The Mechanical Engineering Major must complete 128 credit hours following the approved departmental curriculum. A student must choose technical elective courses from the approved lists under technical electives.

Students must conform to the College of Engineering matriculation requirement.

ACCREDITATION

The undergraduate program in mechanical engineering, leading to the B.S.M.E. degree, is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

CAREER OPPORTUNITIES

The Mechanical Engineering Program provides students with a quality education that will allow immediate entry into industry, government, private practice or graduate work. By far the largest proportion of graduates take jobs with private industry. Such jobs can be classified under the following general headings: Design, Testing, Development, Production, Research, Technical Marketing, Technical Management and Sales. Career opportunities for mechanical engineers are possibly the most diverse of any engineering discipline.

CURRICULUM GUIDE FOR MECHANICAL ENGINEERING MAJORS

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEEN 100	2	GEEN 102	2
GEEN 101	2	CHEM 101	3
ENGL 100	3	CHEM 111	1
MATH 131	4	ENGL 101	3
HIST Elective ¹	3	MATH 132	4
SOC SCI Elective ²	3	HIST Elective ¹	3
	<u>17</u>	HEALTH/PE Elective ³	<u>1</u>
			17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 226	2	MEEN 210	2
MATH 231	4	MEEN 260	2
PHYS 241	3	MEEN 300	2
PHYS 251	1	MEEN 335	3
ECON 300/301	3	MATH 331	3
HUMANITIES Elective ⁴	3	PHYS 242	3
	<u>16</u>	PHYS 252	<u>1</u>
			16

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 336	3	MEEN 400	1
MEEN 337	3	MEEN 416	3
MEEN 441	3	MEEN 440	3
ELEN 200	3	MEEN 442	3
ELEN 206	1	MEEN 474	3
MATH 332	3	INEN 260	<u>2</u>
	<u>16</u>		15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 500	2	MEEN 566	3
MEEN 560	3	MEEN 572	1
MEEN 562	3	MEEN 574	3
MEEN 565	3	MEEN 581	3
TECHNICAL Elective ⁵	3	TECHNICAL Elective ⁵	3
HEALTH/PE Elective ³	1	HUMANITIES Elective ⁴	3
	<u>15</u>		<u>16</u>

Total Credit Hours: 128

¹ 6 hrs of HIST Elective Required. Note Black/Global Studies requirement.

² 3 hrs of Soc Sci Elective required. Note Black/Global Studies requirement.

³ 2 hrs of PHED Elective required. Any two 1-credit PHED courses or PHED 200.

⁴ 6 hrs of HUMANITIES Elective required. See course list on page 7 and note Black/Global Studies requirement.

⁵ 6 hrs of TECH Elective required from MEEN 563, 567, 571, 612, 614, 619, 645, 646, 647, 650; GEEN 601, 602; Others as approved by advisor.

AEROSPACE OPTION IN MECHANICAL ENGINEERING

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
GEEN 100	2	GEEN 102	2
GEEN 101	2	CHEM 101	3
ENGL 100	3	CHEM 111	1
MATH 131	4	ENGL 101	3
HIST Elective ¹	3	MATH 132	4
SOC SCI Elective ²	3	HIST Elective ¹	3
	<u>17</u>	PHED Elective ³	1
			<u>17</u>

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 226	2	MEEN 210	2
MATH 231	4	MEEN 260	2
PHYS 241	3	MEEN 300	2
PHYS 251	1	MEEN 335	3
ECON 300/301	3	MATH 331	3
Humanities Elective ⁴	3	PHYS 242	3
	<u>16</u>	PHYS 252	1
			<u>16</u>

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 336	3	MEEN 400	1
MEEN 337	3	MEEN 415	3
MEEN 441	3	MEEN 440	3
ELEN 200	3	MEEN 422	3
ELEN 206	1	MEEN 474	3
MATH 332	3	ELEN 410	3
PHED Elective ³	<u>1</u>		<u>16</u>
	17		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MEEN 560	3	MEEN 562	3
MEEN 565	3	MEEN 572	1
MEEN 576	3	MEEN 580	3
MEEN 578	3	MEEN 577	1
Aerospace Elective ⁵	<u>3</u>	Humanities Elective ⁴	<u>3</u>
	15		11

Total Credit Hours: 125

¹ 6 hrs of HIST Elective Required. Note Black/Global Studies requirement.

² 3 hrs of Soc Sci Elective required. Note Black/Global Studies requirement.

³ 2 hrs of PHED Elective required. Any two 1-credit PHED courses or PHED 200.

⁴ 6 hrs of HUMANITIES Elective required. See course list on page 7 and note Black/Global Studies requirement.

⁵ 3 hrs of TECH Elective required from MEEN 651, 652, 653, 654, 655, 656; Others as approved by advisor.

COURSES WITH DESCRIPTION IN MECHANICAL ENGINEERING

Undergraduate

MEEN-210. Numerical Methods in Mechanical Engineering **Credit 2(2-0)**

This is a course in numerical techniques for mechanical engineering analysis including numerical integration, differentiation, interpolation, root finding, matrix manipulation and solution of linear simultaneous equations. Prerequisites: GEEN 102, MATH 131.

MEEN-226. Manufacturing Processes **Credit 2(2-0)**

The course provides a quantitative study of materials shaping, forming and fabricating techniques used in manufacturing. Topics covered include machining operations, casting and molding of metals and plastics, and joining and assembly techniques. Case studies are used to illustrate re-design for improved manufacturability. Prerequisites: GEEN 100, GEEN 101.

MEEN-260. Materials Science **Credit 2(2-0)**

This is a basic course in materials science that covers the fundamental nature of materials including their physical, mechanical and chemical characteristics. Topics include: atomic arrangements and atomic bonding; phase diagrams; engineering properties; selection of materials for specific applications. Prerequisite: CHEM 101.

MEEN-300. Mechanical Engineering Laboratory I **Credit 2(0-4)**

This is the first in the sequence of three mechanical engineering laboratory courses. It provides an introduction to mechanical engineering experimentation. Topics covered include: engineering report writing; principles of measurement of length, displacement, angle, strain,

temperature, force and torque; accuracy, error and uncertainty in experimental measurements; statistical process control; principles of sensors, transducers and data acquisition; computer-aided design and manufacturing; and product inspection and testing. Prerequisite: MEEN 226.

MEEN-335. Mechanics I, Statics

Credit 3(3-0)

Basic vector concepts of force, moment of a force; analytical and graphical techniques in the analyses of force and moment; conditions of equilibrium in frames, trusses, machine members under static loads; law of friction; distributed forces, determination of centroid, mass center, area and mass moment of inertia. Prerequisites: MATH 131, PHYS 241.

MEEN-336. Strength of Materials

Credit 3(3-0)

Analysis of stress and strain; stress-strain relations; applications; torsional and flexural loadings; flexural deflections; combined loading; columns. Prerequisite: MEEN 335.

MEEN-337. Mechanics II, Dynamics

Credit 3(3-0)

Introduction to the kinematics of particles and rigid bodies in translation, rotation and plane motion; introduction to the concepts underlying the work-energy principles and impact-momentum principles. Prerequisites: MEEN 335, MATH 132.

MEEN-400. Mechanical Engineering Laboratory II

Credit 1(0-2)

This is the second in the sequence of three mechanical engineering laboratory courses. The course includes selected experiments on material properties, strength and microstructure, and experiments in fluid mechanics and manufacturing. Prerequisites: MEEN 300, MEEN 336. Corequisite: MEEN 416.

MEEN-415. Aerodynamics

Credit 3(3-0)

The course begins with the fundamentals of fluid statics and dynamics followed by an introduction to inviscid flow theory with applications to incompressible flows over airfoils, wings and flight vehicle configurations. Prerequisites: MATH 231; MEEN 337.

MEEN-416. Fluid Mechanics

Credit 3(3-0)

Static and dynamic behavior of fluids: applications to fluid machinery, jet propulsion and instrumentation; dimensional analysis and similitude. Prerequisites: MEEN 337, MATH 231.

MEEN-422. Aero Vehicle Structures I

Credit 3(3-0)

This course covers the determination of typical flight and landing loads and methods of analysis and design of aircraft structures to be able to withstand expected loads. Prerequisites: MEEN 336, MEEN 337, MATH 331.

MEEN-440. Mechanism Design & Analysis

Credit 3(2-2)

This course emphasizes the kinematic issues in the design of mechanisms. Mathematical, graphical and computer methods are used for synthesis and analysis of linkages, cams and gear trains. Project work is assigned to demonstrate the utility of these methods. Prerequisites: MEEN 337 and MEEN 210.

MEEN-441. Fundamentals of Thermodynamics

Credit 3(3-0)

This is a basic course in fundamental thermodynamic principles. The topics covered include: energy, heat and work, thermodynamic properties of substances; real and ideal gases; first and second laws of thermodynamics from a macroscopic viewpoint. Prerequisites: MATH 231; CHEM 101; PHYS 242.

MEEN-442. Applied Thermodynamics

Credit 3(3-0)

This course involves applications of basic thermodynamic principles to real systems. The topics covered include: gaseous mixtures, psychrometrics, combustion, power cycles and refrigeration cycles. Prerequisite: MEEN 441.

MEEN-444. Undergraduate Projects**Credit Variable (1-3)**

Study arranged on engineering topics of interest to student. A faculty member will serve as project advisor. Topics may include analytical and/or experimental work and encourages independent study. Prerequisite: Permission of Department and consent of faculty member as advisor.

MEEN-474. Engineering Design**Credit 3(2-2)**

This course provides an introduction to mechanical design. Lectures cover the following topics; codes and standards; ethics; project planning; technical writing; design of machine elements for static and fatigue strength. Individual and group design projects are assigned. Prerequisites: MEEN 210, MEEN 226, MEEN 300, MEEN 336.

MEEN-500. Mechanical Engineering Laboratory III**Credit 2(0-4)**

This is the final course in the sequence of three mechanical engineering laboratories. The course includes selected experiments in fluid mechanics, heat transfer, and engineering material properties. A project is included which requires the students to design and construct an experiment. Prerequisite: MEEN 400. Corequisites: MEEN 560, MEEN 562.

MEEN-540. Dynamics of Mechanical Engineering Systems**Credit 3(2-2)**

A unified treatment of mechanical, fluid, and thermal dynamic systems. Emphasis is placed upon the physical characteristics of the systems, mathematical model formulation, exercise of models through modern computational techniques, and correlation of model behavior with that of existing systems. The synthesis and design of systems through model manipulation is covered. Prerequisites: MEEN 562, 442, 440, and ELEN 442.

MEEN-544. Special Topics**Credit Variable (1-3)**

A senior level course on topics not covered in other mechanical engineering courses. There is to be a title specified for the course, which indicates the contents. The students records will carry both course number and name. This course will satisfy the requirements for a Technical Elective, and approval of the syllabus and other course details must be secured from the department curriculum committee.

MEEN-560. Modern Engineering Materials**Credit 3(3-0)**

Role of materials in engineering; properties of materials; nonferrous and ferrous systems and applications; heat treatment and strengthening mechanisms; various polymeric, ceramic and composite materials and their applications; failure theories; project work involving selection and design with various material systems. Prerequisites: MEEN 226, MEEN 360.

MEEN-562. Heat Transfer**Credit 3(3-0)**

This course covers the fundamentals of heat conduction, convection, radiation, boiling and condensation, and heat exchangers. Students are introduced to thermal design through individual and/or group projects. Prerequisites: MEEN 415 or MEEN 416, MEEN 441, MATH 332.

MEEN-563. Energy Conversion System Design**Credit 3(3-0)**

Design considerations in steam power systems, internal combustion power systems, refrigeration and heat pump systems, overview of direct energy conversion devices. Power system design project work. Prerequisites: MEEN 416, MEEN 442.

MEEN-565. Design of Machine Elements**Credit 3(2-2)**

This course covers the principles and practices of the design of machine elements. The interaction between design and manufacturing is emphasized. Design project work is assigned. Prerequisites: MEEN 440, MEEN 474.

MEEN-566. Design of Thermal Systems**Credit 3(3-0)**

Selection of components for fluid and energy processing systems to meet system performance requirements, computer-aided thermal design; simulation and optimization techniques and investment economics. Design projects are assigned to demonstrate application of these topics. Prerequisites: MEEN 562, INEN 460.

MEEN-567. Environmental Control**Credit 3(3-0)**

Principles of heating and air conditioning and their applications to design of environmental control systems; determination of building heating and cooling loads, principal equipment, layout and controls are discussed for various types of systems. Prerequisites: MEEN 442 and 562.

MEEN-568. Gas Dynamics**Credit 3(3-0)**

Principles of one-dimensional compressible fluid flow. Normal shocks. Flow with friction, heating and cooling. Introduction to two-dimensional flows. Experimental work in fluid flow. Prerequisites: MEEN 416 and 441.

MEEN-570. Internal Combustion Engines**Credit 3(2-2)**

Fundamental principle of spark-ignition and compression-ignition engines; the combustion phenomena; the effect of fuel-air mixture; design of components of an internal combustion engine; testing and performance curves; design project. Prerequisites: MEEN 440 and 442.

MEEN-571. Turbomachinery**Credit 3(3-0)**

The Cascade theory, applied to turbomachines; impulse and reaction turbines; compressible fluid dynamics, gas turbine principle; pumps, compressors and blowers; design of turbomachine elements, project work. Prerequisites: MEEN 416 and 442.

MEEN-572. Mechanical Engineering Seminar**Credit 1(1-0)**

This weekly seminar course utilizes invited speakers to address such topics as resume preparation, interviewing, ethics, and professional registration, as well as technical topics presented by graduate students and faculty researchers. Prerequisite: Senior standing in M.E.

MEEN-574. Mechanical Systems Design**Credit 3(2-2)**

This is a capstone design course for mechanical engineering majors. Comprehensive group projects are assigned involving design of engineering systems with such constraints as performance, time, budget, safety, manufacturability and liability. Projects are selected from suggestions by faculty and industry. Prerequisites: MEEN 560, MEEN 562, MEEN 565, ELEN 200.

MEEN-575. Solar Energy Fundamentals and Design**Credit 3(3-0)**

Characterization of solar radiation at the earth's surface. Discussion and analysis of solar collectors of both flat plate and concentrating types, storage systems, distribution systems and controls. System sizing, design and economic analysis for space heating, water heating and industrial process heat. Prerequisite: MEEN 562.

MEEN-576. Propulsion**Credit 3(3-0)**

This introductory course to aeropropulsion systems includes coverage of one-dimensional internal flow of compressible fluids, normal shock, flow with friction, and simple heat addition. The basic concepts are applied to airbreathing aircraft propulsion systems. Prerequisites: MEEN 415, MEEN 441.

MEEN-577. Aerodynamics and Propulsion Laboratory**Credit 1(0-2)**

This is a laboratory course which provides experimental verification of concepts learned in MEEN 415 and MEEN 576. Experiments are performed that reinforce the concepts from the lecture courses including wind tunnel experiments and performance of a gas turbine engine. Prerequisite: MEEN 415. Corequisite: MEEN 576.

MEEN-578. Flight Veh. Performance**Credit 3(3-0)**

This course provides an introduction to the performance analysis of aircraft. Aircraft performance in gliding, climbing, level, and turning flight are analyzed as well as calculation of vehicle take-off and landing distance, range and endurance. Prerequisites: MATH 231, MEEN 337.

MEEN-580. Aerospace Vehicle Design**Credit 3(3-0)**

This is the capstone design course for the aerospace option. This course requires the synthesis of knowledge acquired in previous courses and the application of this knowledge to the design of a practical aerospace vehicle system. Prerequisites: MEEN 422, 474, 576, 578; ELEN 410.

MEEN-581. Mechanical Vibrations**Credit 3(3-0)**

This is an introductory course on free and forced vibrations of damped and undamped, single and multidegree of freedom, discrete and continuous systems. Applications to vibration isolation and control are covered. Design project work is assigned. Prerequisites: MEEN 440, MATH 332.

MEEN-612. Modern Composite Materials**Credit 3(3-0)**

Basic concepts of micromechanics and laminate theory are introduced. Strength and failure are studied and temperature and humidity effects are analyzed. Structural components are designed to replace isotropic materials with composites. Special emphasis is placed on developing a computer code for design of composite laminates. Prerequisites: MEEN 210, MEEN 336 or equivalent.

MEEN-614. Mechanics of Engineering Modeling**Credit 3(3-0)**

Engineering modeling techniques including time dependent integration and simulation models of systems, finite difference and finite element methods in mechanics. Prerequisites: MEEN 210, MEEN 336, MATH 332 or equivalent.

MEEN-619. Computer Aided Graphics and Design**Credit 3(3-0)**

This course covers computer graphics and design principles. Applications of various graphics and computational tools for the design of mechanical systems will be emphasized and discussed. Individual and group design projects will be given to illustrate the applications of these techniques to real problems. Prerequisites: MEEN 210, MEEN 440, MEEN 564.

MEEN-645. Aluminum Product Des & Manuf.**Credit 3(3-0)**

This course introduces students to the principles of product and manufacturing process design specifically applicable to aluminum-based materials. Material properties of aluminum are compared with those of other commercial materials. Raw material fabrication and product manufacturing processes are presented. The interactions between processes and material properties are described. Case studies are presented to guide the student in successful completion of design projects. Prerequisites: MEEN 260, MEEN 474.

MEEN-646. Advanced Manufacturing Processes**Credit 3(3-0)**

Theory, application, and design considerations for forming and machining. Machines and tooling in modern manufacturing processes. Dimensional and tolerance analysis. Control of workpiece and tool. Projects in the design of molds, dies, presses, jigs and fixtures and automated machinery. Prerequisites: MEEN 226 or equivalent, MEEN 564, MATH 231.

MEEN-647. Advanced Mechanism Design**Credit 3(3-0)**

Advanced synthesis techniques; kineto-static and dynamic issues in design of mechanisms. Use of digital simulations for design of mechanisms. Design projects are assigned to illustrate the applications of these techniques. Prerequisite: MEEN 440.

MEEN-650. Mechanical Properties and Structure of Solids **Credit 3(3-0)**

An examination of the elastic and plastic behavior of matter in relation to its structure, both macroscopic and microscopic. Major representative classes of materials to be examined are thermoplastic materials, elastomers, glasses, ceramics, metals, and composites. Prerequisite: MEEN 560 or equivalent.

MEEN-651. Aero Veh. Structures II **Credit 3(3-0)**

This course covers deflection of structures, indeterminate structures, fatigue analysis, and minimum weight design. Finite element methods and software are utilized. Prerequisite: MEEN 422.

MEEN-652. Aero Vehicle Stability & Control **Credit 3(3-0)**

This technical elective course covers longitudinal, directional and lateral static stability and control of aerospace vehicles. It also covers linearized dynamic analysis of the motion of a six degree-of-freedom flight vehicle in response to control inputs and disturbances through use of the transfer function concept, plus control of static and dynamic behavior by vehicle design (stability derivatives) and/or flight control systems. Prerequisites: MEEN 415, 422, and ELEN 410.

MEEN-653. Aero Vehicle Flight Dynamics **Credit 3(3-0)**

This technical elective course covers the basic dynamics of aerospace flight vehicles including orbital mechanics, interplanetary and ballistic trajectories, powered flight maneuvers and spacecraft stabilization. Prerequisites: MATH 332; MEEN 337; MEEN 422.

MEEN-654. Advanced Propulsion **Credit 3(3-0)**

This technical elective is a second course in propulsion. It covers the analysis and design of individual components and complete air-breathing propulsion systems including turbo fans, turbo jets, ram jets and chemical rockets. Prerequisite: MEEN 576.

MEEN-655. Computational Fluid Dynamics **Credit 3(3-0)**

This technical elective course provides an introduction to numerical methods for solving the exact equations of fluid dynamics. Finite difference methods are emphasized as applied to viscous and inviscid flows over bodies. Students are introduced to a modern Computational Fluid Dynamics computer code. Prerequisites: MATH 332; MEEN 415 or MEEN 416.

MEEN-656. Boundary Layer Theory **Credit 3(3-0)**

This course covers the fundamental laws governing flow of viscous fluids over solid boundaries. Exact and approximate solutions are studied for various cases of boundary layer flow including laminar, transitional and turbulent flows. Prerequisites: MEEN 415 or 416.

TECHNICAL ELECTIVES

All M.E. majors (except Aerospace option students) are required to take two technical electives to be chosen from the following list, or other courses approved by the students academic advisor. Each of these electives has 3 credit hours containing 2 credit hours of Engineering Science and 1 credit hour of Engineering Design content.

DEPT.	NO.	COURSE
MEEN	563	Energy Conversion System Design
MEEN	567	Environmental Control
MEEN	571	Turbomachinery
MEEN	612	Modern Composite Materials
MEEN	614	Engineering Modeling
MEEN	619	Computer Aided Graphics and Design
MEEN	645	Aluminum Product Design and Manufacturing
MEEN	646	Advanced Manufacturing Processes
MEEN	647	Advanced Mechanism Design
MEEN	650	Mechanical Properties and Structure of Solids
GEEN	601	Industrial Automation
GEEN	602	Advanced Manufacturing Laboratory
MEEN	651	Aero Vehicle Structures II
MEEN	652	Aero Vehicle Stability and Control
MEEN	653	Aero Vehicle Flight Dynamics
MEEN	654	Advanced Propulsion
MEEN	655	Computational Fluid Dynamics
MEEN	656	Boundary Layer Theory

DIRECTORY OF FACULTY

V. Sarma Avva, B.S., Saugor University DMIT, Madras Institute of Technology; M.S., Oklahoma State University; Ph.D., Pennsylvania State University; Professor

Suresh Chandra, B.S., Allahabad University, B.Sc. (Ch.E.), Banaras Hindu University; M.S., University of Louisville; Ph.D., Colorado State University; Research Professor

Rajinder S. Chauhan, B.S., Guru Nanak Engineering College; MT Indian Institute of Technology; Ph.D., Auburn University, Assistant Professor

John C. Chen; B.S., University of Virginia; M.S., Ph.D. Stanford University; Assistant Professor

William J. Craft, B.S., North Carolina State University; M.S., Ph.D., Clemson University; Professor and Chairperson (P.E.)

DeRome O. Dunn, B.S., M.S., North Carolina A&T State University; Ph.D., Virginia Polytechnical Institute and State University, Assistant Professor

George J. Filatovs, B.S., Washington University at St. Louis; Ph.D., University of Missouri at Rolla; Professor

Meldon Human; B.S., Northwestern University; M.S., Ph.D., Stanford University; Associate Professor

Kenneth M. Jones, B.S., M.S., Ph.D., North Carolina State University; Assistant Professor

Ajit D. Kelkar, B.S., Poona University; M.S., South Dakota State University; Ph.D., Old Dominion University; Associate Professor

David E. Klett, B.S., Michigan State University; M.S., Ph.D., University of Florida; Professor (P.E.)

Tony C. Min, B.S., Chiao Tung University-Shanghai; M.S., University of Tennessee; Ph.D., University of Tennessee; Professor Emeritus (P.E.)

Samuel P. Owusu-Ofori, B.S., University of Science and Technology-Kumasi, Ghana; M.S., Bradley University; Ph.D., University of Wisconsin-Madison; Professor (P.E.)

Devdas M. Pai, B.S., Indian Institute of Technology, Madras, India; M.S., Ph.D., Arizona State University; Associate Professor (P.E.)

P. Frank Pai; B.S., Tamkang University; M.S., National Taiwan University; Ph.D., Virginia Polytechnic Institute and State University; Assistant Professor

Jagannathan Sankar, B.E., University of Madras, M.E., Concordia University, Ph.D., Lehigh University, Professor

Mark J. Schulz, B.T., M.S., Ph.D., State University of New York at Buffalo; Assistant Professor

Lonnie Sharpe, Jr., B.S., North Carolina A&T State University; M.S., North Carolina State University; Ph.D., University of Illinois, Professor and Associate Dean (P.E.)

Kunigal N. Shivakumar, B.E., Bangalore University; M.E., Ph.D., Indian Institute of Science; Research Professor

Shih-Liang Wang, B.S., National Tsing Hua University; M.S., Ph.D., Ohio State University; Associate Professor (P.E.)

THE SCHOOL OF NURSING

Beverly L. Malone, Dean

Janice G. Brewington, Assistant Dean

The School of Nursing offers a program leading to the Bachelor of Science Degree in Nursing. The school is organized into lower and upper divisions. The first two academic years or lower division of the program, encompass the core requirements of the University and the foundation courses for the major. The upper division or last two academic years, is largely devoted to nursing courses.

MISSION STATEMENT FOR SCHOOL OF NURSING

The mission of the School of Nursing at North Carolina Agricultural and Technical State University is to provide quality instruction to meet the requirements for the Bachelor of Science in Nursing degree. Specifically, the instructional mission is two-fold:

1. To prepare a nurse-generalist at the baccalaureate level for beginning professional practice.
2. To provide opportunities for registered nurses to complete the Bachelor of Science degree.

A concomitant mission of the School of Nursing is to promote faculty development, research, curriculum development, admission and retention of both generic and registered nurse students, and community service.

CURRICULUM PURPOSE

The purpose of the baccalaureate program in nursing at North Carolina Agricultural and Technical State University is to prepare a nurse generalist for beginning professional practice. A special emphasis is the preparation of minority nurses. The program provides a body of knowledge which is derived from liberal arts, biological, physical, behavioral sciences and nursing. The program provides the foundation for advanced preparation in nursing and life-long learning. The graduate will contribute to advancement of the nursing profession by the use of research and management skills.

PHILOSOPHY OF THE SCHOOL OF NURSING

The School of Nursing is an integral part of North Carolina Agricultural and Technical State University and adheres to the purpose and objectives of the University. The School subscribes to the principles and theories that describe and predict man's behavior.

We view human beings as unique, biopsychosocial and spiritual individuals who have worth and value. An interactive relationship exists between the individual and the environment. Human beings have the ability to adapt to stimuli. Human beings are diverse and have the potential for growth and maturity. They vary in their capacity to learn and to assume responsibility for their behavior. They assume different points on the health-illness continuum, can move in any direction, and vary in their ability to participate in health care activities.

We believe the environment is a dynamic, culturally diverse structure which consists of individuals, families, groups and communities. The family is the basic unit of society. The environment consists of internal and external conditions, circumstances, and influences affecting the individual. We believe that internal and external stimuli represent stressors which elicit responses from man's adaptive system.

We believe that health is a dynamic state that is affected by internal and external environments. Human beings respond to stimuli in the environment and those behavioral responses are exhibited as adaptive modes. We believe that health is on a continuum from health to illness or death.

One's perception of health is influenced by individual and cultural beliefs. Health care is a right for all, and human beings should have access to resources that promote health and prevent illness.

The health care system is a diverse, interrelated entity that is constantly changing with the advent of technological and health-promoting discoveries. The system has political, socio and economic elements in addition to the variety of health care settings, the various providers, and the culturally diverse populations who are served.

We believe that professional nursing is a changing, interactive, practice discipline and as such professional nursing practice is based on the synthesis of liberal education, scientific and professional knowledge, clinical and cognitive skills, and the value system of the individual. The professional nurse assumes the roles of learner, practitioner, teacher, collaborator, leader, manager, and client advocate.

The nursing process is the scientific method used to design nursing care. Steps in the nursing process include assessing, nursing diagnosis, planning, implementation, and evaluation. The professional nurse has the ability to make clinical judgments in structured and unstructured settings. The professional nurse designs and provides interventions that will promote, maintain, and restore health for clients related to adaptive modes. The nurse provides illness care, rehabilitative care, health counseling, and health teaching for clients.

We believe research serves to expand the theoretical and practice bases of nursing as it continues to emerge as a profession. Research generates knowledge that is used in nursing practice. Nursing research is application of the scientific method of critical inquiry to the study of client problems that can be resolved through nursing intervention. We further believe that the baccalaureate graduate in nursing is a consumer of research.

The professional nurse assumes a leadership role in health care management to improve client care. The professional nurse demonstrates leadership through advocacy, interdisciplinary collaboration, and active participation in professional organizations.

Higher education provides a foundation where students may find a sense of identification, belonging, responsibility, and achievement that will prepare them for roles of leadership and service. Higher education encourages the synthesis of knowledge and the effective use of analytical and communication skills. The academic experience prepares students for lifelong learning. We believe the student who is a registered nurse enrolled in the baccalaureate nursing program needs a learning environment that builds on prior knowledge and experience.

We believe the baccalaureate degree is the first professional degree in nursing, and prepares the nurse to function as a generalist within the health care system. Baccalaureate nursing education strives for a synthesis of learning from the liberal arts, sciences and nursing. The body of knowledge for nursing is derived from nursing theories, research and clinical practice. Baccalaureate nursing education provides a base for understanding of human beings, the cultivation of intellectual and technological skills, the examination of the learner's own values and beliefs, and the understanding and respect for values of others in a multicultural society. Baccalaureate education provides the student with a relevant knowledge base along with clinical and professional skills that provide a basis for clinical judgment. Baccalaureate nursing education provides the basis for graduate preparation in nursing and establishes a foundation for lifelong learning.

Teaching and learning are a systematic, interactive process where outcome is measured by a change in behavior. This process involves the cognitive, psychomotor, and affective domains of learning. Students learn in a variety of ways, and learning takes place best when students are actively involved in the process and share responsibility for their learning. The curriculum seeks to employ flexible approaches to meet the needs of learners. Individualized plans of study are developed for registered nurse students.

PROGRAM OBJECTIVES

The objectives of the Nursing Program at North Carolina Agricultural and Technical State University are designed to provide learning experiences that will assist nursing students to:

1. Assimilate knowledge from the physical, biological, psychosocial, the liberal arts, nursing theories, and particularly Roy's Adaptation Model, as a foundation to provide nursing care to clients in a variety of settings.
2. Utilize the nursing process with skills of critical thinking to assist clients in achieving adaptation.
3. Utilize nursing theories and related research findings to enhance professional nursing practice.
4. Develop leadership and management abilities in the practice of professional nursing and in effecting change.
5. Assume the role of client advocate, teacher, facilitator, collaborator, and coordinator with other health care professionals and consumers to improve delivery of health care to meet the health needs of society.
6. Assume responsibility and accountability for professional nursing actions, their outcomes and for enhancing professional nursing practice.
7. Demonstrate personal and professional growth as individuals and citizens.
8. Develop professional values, ethical, moral, legal and political aspects of the practice of nursing.
9. Develop technological skills to assist learning, to deliver and document patient care, and to provide professional nursing services.

ACCREDITATION AND MEMBERSHIPS

The program offered by the School of Nursing is approved by the North Carolina Board of Nursing and accredited by the National League for Nursing. The School of Nursing is an agency member of the National League for Nursing in the NLN Council of Baccalaureate and Higher Degree Programs, the American Association of Colleges of Nursing and the Southern Regional Education Board Council on Collegiate Education for Nursing.

GENERAL PROGRAM REQUIREMENTS

All School of Nursing policies supersede University policy.

General Information

Pre-nursing majors are required to purchase uniforms for the spring semester of the sophomore year. The estimated cost is one hundred eighty dollars (\$180.00). Beginning in the summer, prior to the sophomore year (July 1), students are required to secure liability insurance annually through the School of Nursing. Tuberculosis skin test, other immunizations, and CPR certification must be obtained annually. If the information is not completed or submitted by the deadlines, students will not be allowed to register for sophomore level nursing courses or be considered for the nursing program. If students pre-registered, their courses will be dropped. Students are responsible for transportation to clinical agencies which may be outside of the Greensboro area.

The School of Nursing believes that the professional development of a nursing student is essential. Based on this belief, students are required to be in attendance for Founder's Day, Honors Convocation, Capping and Pinning, Sigma Theta Tau activities and other events designated by the Dean as related to the professional nature of nursing. Students are required to attend all nursing classes.

A total of 125 credit hours is required for graduation with a Bachelor of Science in Nursing degree (63 credit hours of nursing courses and 62 credit hours of non-nursing courses). A minimum of 36 credit hours must be earned at North Carolina Agricultural and Technical State University. All nursing courses must be completed with a cumulative grade point average of not less than 2.6. Graduates of the nursing program are eligible to take the National Council of State Boards of Nursing Licensure Examination for Registered Nurses (NCLEX-RN).

School of Nursing

(effective August 1994)

I. Admission Criteria for Pre-Nursing Majors

Freshmen and Transfer students admitted into the University as pre-Nursing majors must meet the following criteria:

- A. Have a combined Scholastic Aptitude Test (SAT) score of “750” and achieve cumulative grade point average of “B” or better.
- B. If criteria A is not met, a student may enter the University as an “Undecided” major and enroll in all first year courses of the nursing curriculum. If all courses are completed with a cumulative GPA of 2.6, the student may be admitted as a pre-nursing major.

Students must complete Biological Science 100, Chemistry 104 and 114 with a minimum grade of “C” before enrolling in sophomore level nursing courses.

Transfer Students admitted into the university as pre-Nursing majors must meet the following criteria:

- A. Overall cumulative grade point average of 2.6 or above from transfer institution;
- B. Completion of the following courses with a grade of “C” or better;
CHEM 104, 114 (4) BIOL 100 (4) MATH 101, 102 (6)
ENGL 100, 101 (6) or;
- C. If criteria A or B is not met, a student may enter the university as an “Undecided” major and enroll in all first year courses of the nursing curriculum. If all courses are completed with a cumulative GPA of 2.6, the student may be admitted as a pre-nursing major.

II. Admission into the Nursing Major (Upper Division)

Students are formally admitted into the School of Nursing at the junior level. Admission to the University does not guarantee acceptance in the nursing major. Admission into the School of Nursing is contingent upon the availability of space. Health agencies in the Piedmont and surrounding counties work collaboratively with the School of Nursing to provide clinical learning experiences for students. The availability of clinical resources as well as the North Carolina Board of Nursing’s enrollment cap for the School of Nursing determine the size of each junior class. Therefore, it is impossible to assure space for every student who meets the criteria.

Students must meet the following criteria to be considered for admission into the nursing major:

- A. Matriculation as a pre-nursing student.
- B. Overall cumulative grade point average of 2.6 or above.
- C. Completion of natural science courses with a grade of "C" or better:
 - BIOL 100 (4) CHEM 104 (3) CHEM 114 (1)
 - BIOL 220 (4) BIOL 369 (3) BIOL 370 (3)
- D. Completion of the following additional prerequisites with a grade of "C" or better:
 - MATH 101 (3) MATH 102 (3) ENGL 100 (3)
 - ENGL 101 (3) SPCH 250 (3) SOCI 100 (3)
 - HEFS 310 (3) PSYC 320 (3)
- E. Completion of the following prerequisite Nursing courses with a grade of "C" which is a "77" (2.6 GPA):
 - NURS 100 (1) NURS 202 (2) NURS 300 (3)
 - NURS 320 (3) NURS 350 (2) NURS 351 (2)
 - NURS 390 (4) [RN/LPN]

III. Admission Criteria for Registered Nurse Students

- A. Registered nurses who meet criteria for admission to the University are accepted as transfer students. Presentation of current North Carolina license is required for acceptance into the nursing program. All courses in the nursing curriculum must be completed satisfactorily by challenge examination, completion of course work or transfer of credit.
- B. Registered nurse students must follow the progression requirements and meet the graduation requirements.

Progression requirements

- 1. Courses in the nursing major must be completed in the sequence of the designed curriculum.
- 2. All science courses required in the nursing major must be completed with achievement of 2.0 grade point for each.
- 3. Each nursing course must be completed with a grade point of 2.6 (77).
- 4. A second failure in the nursing major will prevent continuing in the nursing program for any enrolled nursing student.

CAREER OPPORTUNITIES

The Bachelor of Science in Nursing degree, when accompanied by nursing licensure, prepares the graduate for beginning practice in a variety of health care settings. Some possible opportunities include institutions such as hospitals, public health agencies, clinics, military services, home health, and extended care facilities.

POLICY REGARDING PHYSICAL OR EMOTIONAL HEALTH

Students seeking admission to the University must have a physical examination before enrollment. Students seeking admission into the sophomore level of nursing must have a pre-entrance physical examination, which must include a mental health assessment.

The School of Nursing reserves the right to dismiss a student from the program who (1) presents problems in physical or emotional health which do not respond to appropriate treatment and/or counseling within a reasonable period of time and (2) demonstrates behavior which conflicts with safety essential to nursing. Students who are dismissed will be accorded due process.

CURRICULUM GUIDE FOR NURSING MAJORS

(Option: Generic)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 101	3	MATH 102	3
ENGL 100	3	ENGL 101	3
BIOL 100	4	HIST ¹	3
NURS 100	1	CHEM 104	3
SPCH 250	3	CHEM 114	1
PHED ²	<u>1 or 2</u>	PHED ²	1 or 2
	15-16	NURS 202	<u>2</u>
			16-17

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 220	4	BIOL 370	3
Humanities ³	3	HEFS 310	3
SOCI 100	3	PSYC 320	3
BIOL 369	3	NURS 350	2
NURS 300	<u>3</u>	NURS 351	2
	16	NURS 320	<u>2</u>
			15

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
HEFS 337	3	Humanities ³	3
PSYC 434	3	NURS 410	4
NURS 400	5	NURS 411	2
NURS 401	<u>5</u>	NURS 412	3
	16	NURS 413	<u>3</u>
			15

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
NURS 500	6	NURS 510	3
NURS 501	4	NURS 511	3
NURS 504	3	NURS 512	3
Elective ⁴	<u>3</u>	NURS 513	3
	16	NURS 514	2
		NURS 518	<u>2</u>
			16

Total Credit Hours: 125-127

¹ Any history course may be taken.

² Only a total of two credit hours of physical education is required.

³ Humanities includes courses in literature, music, art, theater and religion.

⁴ Statistics or foreign language (preferably Spanish) is strongly recommended.

RN-BSN PROGRAM GENERAL INFORMATION

The goal of the RN Option program is to provide the registered nurse student an opportunity to obtain a Bachelor of Science in Nursing degree. The program is designed to graduate nurses who will function in a variety of settings, provide leadership with good managerial skills, use applied research, and be prepared for graduate nursing education.

A total of 125 semester hours of credit is required for graduation. The same admission and progression criteria for the generic student applies to the RN student.

Credit by Examination RN Students

The registered nurse student can receive credit by examination for the following courses:

- I. General education courses (15 credit hours).
- II. NLN Challenge Examinations:
 1. Foundations of Nursing equivalent to:
NURS 300
NURS 350
NURS 351
 2. Care of the Adult Client equivalent to:
NURS 400
NURS 401
NURS 410
NURS 411
 3. Care of the Client with Mental Disorder equivalent to:
NURS 412
NURS 413
 4. Care of the Child/Care of the Childbearing Family equivalent to:
NURS 500
NURS 501
 5. NURS 518 Comprehensive nursing achievement test is equivalent to:
- III. The passing score for NURS 320 - Health Assessment Challenge Examination is "80" (C).

A total of forty-five (45) nursing credit hours may be earned.

Nursing 390 can be taken either semester. Foreign language and statistics are suggested electives for those planning to go to graduate school.

CURRICULUM GUIDE FOR NURSING MAJORS

(Option: Registered Nurse)

Freshman Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
MATH 101	3	MATH 102	3
ENGL 100	3	ENGL 101	3
BIOL 100	4	HIST	3
SPCH 250	3	CHEM 104	3
PHED ¹	1 or 2	CHEM 114	1
	<u>14-15</u>	PHED ¹	<u>1 or 2</u>
			14-15

Sophomore Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
BIOL 220	4	BIOL 370	3
SOCI 100	3	HEFS 310	3
BIOL 369	3	PSYC 320	3
NURS 390 (RN/LPN) ²	4	NURS 390 (RN/LPN) ²	4
	<u>10-14</u>		<u>9-13</u>

¹ Only a total of two credit hours of physical education is required.

² Nursing 390 may be taken either semester.

Junior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
Humanities	3	Humanities	3
PSYC 434	3		3
HEFS 337	3		
	<u>9</u>		

Senior Year

<i>First Semester</i>	<i>Credit</i>	<i>Second Semester</i>	<i>Credit</i>
NURS 504	3	NURS 510	3
Elective	3	NURS 511	3
	<u>6</u>	NURS 512	3
		NURS 513	3
		NURS 514	2
			<u>14</u>

Total Credit Hours: 79-89

Licensed Practical Nurse Program (LPN) General Information

The LPN program provides an opportunity for the student to complete the educational requirements for a Baccalaureate of Science in Nursing degree in a flexible, supportive environment. LPNs are admitted to the University as transfer students. Individualized counseling for course selection is provided prior to admission. The overall goal of the LPN program option is to graduate nurses who will function in a variety of settings, provide leadership with good managerial skills, use applied research, and be prepared for graduate nursing education.

The same admission and progression criteria for the generic student applies to the LPN student.

Credit by Examination LPN Students

LPNs can receive credit by examination for the following:

- I. General education courses (15 credit hours).
- II. NLN challenge examinations:
Foundations of Nursing equivalent to:
NURS 300
NURS 350
NURS 351
- III. The passing score for NURS 320 - Health Assessment Challenge Examination is "80" (C).

A total of nine (9) nursing credit hours may be earned.

COURSES WITH DESCRIPTION IN NURSING

NURS-100. Nursing Orientation

Credit 1(1-0)

This course provides an overview of the University and School of Nursing. Emphasis is on strategies for academic success and personal adjustment through the use of supportive services. An introduction to the nursing profession, its concepts, issues, opportunities and challenges are explored.

NURS-202. Nursing Interactive Processes

Credit 2(2-0)

This course is designed to present the broad range of interactive processes: interpersonal, intrapersonal or interactive between self and others, as well as the interactive processes between professional nursing and the present health care arena. It is designed to increase self-understanding, the interplay of self and others, and processes basic to all groups. The nurse's role and personal power to influence colleagues, families, work groups, organizations and formal groups will be examined.

NURS-300. Perspectives of Professional Nursing I

Credit 3(2-2)

The focus of this course is on the identification of man's physiological, safety and psychosocial needs. The nursing process is introduced as a problem-solving method in meeting basic needs of man. The course also introduces various concepts of professional nursing. Concepts stressed are communication, health care delivery, nursing roles, moral, ethical and legal issues. The laboratory component involves practice of psychomotor skills in a simulated setting.

NURS-320. Health Assessment

Credit 2(1-2)

This course focuses on the broad scope of health assessment including health promotion and health maintenance, practice of interviewing, and physical assessment. Opportunity will be provided for students to practice physical assessment skills in a laboratory setting.

NURS-350. Perspectives of Professional Nursing II

Credit 2(2-0)

After completion of Nursing 300, this course provides further exploration of the nursing process as the methodology used to provide patient care across the life span. Course content includes, but is not limited to, life span development, pharmacology, stress and adaptation, and teaching-learning.

NURS-351. Perspectives of Professional Nursing II Practicum

Credit 2(0-6)

This practicum course allows students to acquire and apply basic nursing skills. Practice occurs in an on-campus laboratory and in selected health care settings. The nursing process is the methodology used to provide patient care.

NURS-390. Transition Into Baccalaureate Nursing **Credit 4(4-0)**

This course is designed to facilitate the transition of registered nurse and licensed practical nurse students into baccalaureate nursing. The philosophy, objectives and policies of the University and School of Nursing are discussed. The broad range of interactive processes and the nursing process are the major focus of the course.

NURS-400. Nursing Care of Adults I **Credit 5(5-0)**

The course is designed to study adaptation problems of the adult client. Emphasis is on the interrelationship of self concept, interdependence, physiological and role function modes of adaptation. The nursing process is utilized to design the plan of care.

NURS-401. Nursing Care of Adults I Practicum **Credit 5(0-15)**

This is a nursing practicum course with emphasis on the care of the adult client. The focus is on the application of the nursing process in providing nursing care. The laboratory component is designed to provide practice of psychomotor skills related to nursing care.

NURS-410. Nursing Care of Adults II **Credit 4(4-0)**

The focus of this course is the continuation of the acquisition of knowledge related to care of adult clients with complex health problems of adaptation. The nursing process is utilized to design the plan of care.

NURS-411. Nursing Care of Adults II Practicum **Credit 2(0-6)**

This is a nursing practice course with emphasis on providing care to adults with complex problems of adaptation. The nursing process is used as the methodology for patient care.

NURS-412. Psychiatric Mental Health Nursing **Credit 3(3-0)**

This course is designed to study psychosocial responses of man to internal and external environmental stimuli. Nursing roles for health promotion are discussed. The nursing process is the method used to assist individuals and groups to achieve adaptation.

NURS-413. Psychiatric Mental Health Nursing Practicum **Credit 3(0-9)**

This course is designed to provide nursing care to clients experiencing alterations in psychosocial responses. The nursing process is applied to assist individuals and groups in achieving an optimum level of adaptation to internal and external environmental stimuli. Clinical activities are in psychiatric and community agencies.

NURS-500. Nursing Care of the Childbearing Family **Credit 6(6-0)**

This course focuses on the study of concepts and theories essential in providing nursing care to childbearing families, infants and children. Incorporated into the course are methods of adaptation to the physiological and psychosocial stressors inherent in this group of clients. The student assists with health promotion, maintenance and restoration activities for families in various developmental stages.

NURS-501. Nursing Care of the Childbearing Family Practicum **Credit 4(0-12)**

This is a nursing practice course with emphasis on providing nursing care to selected childbearing and pediatric clients. Opportunities are provided for the learner to apply the nursing process to enhance normal growth and development, and maintain health in acute and ambulatory settings.

NURS-504. Nursing Research **Credit 3(3-0)**

This course is an introduction to the research process. Emphasis is placed on utilization and application of the research process to problems in nursing.

NURS-510. Community Health Nursing **Credit 3(3-0)**

This course focuses on the care of clients experiencing health problems as individuals, families, groups and communities. Emphasis is on the utilization of the nursing process in

promoting, maintaining, and restoring health. The epidemiological approach is introduced as a methodology for the study of populations and high risk groups in various settings.

NURS-511. Community Health Nursing Practicum **Credit 3(0-9)**

This practicum is designed to provide the student with the opportunity to apply the nursing process in meeting the multiple health needs of individuals, families and groups. Emphasis is placed on the epidemiological approach to resolving complex health problems.

NURS-512. Complex Health Problems Across the Life Span **Credit 3(3-0)**

This course focuses on transition into professional nursing. It is designed to study selected complex problems of adaptation across the life span. The nursing process is utilized to design the plan of care for clients with complex health problems requiring a variety of interventions. A theoretical framework for making ethical decisions is presented.

NURS-513. Complex Health Problems Across the Life Span Practicum **Credit 3(0-9)**

This is a nursing practice course with emphasis on providing care to clients across the life span with complex problems of adaptation. Nursing care emphasis is on promoting adaptation. Learning experiences take place in a variety of settings.

NURS-514. Management & Leadership in Health Care Organizations **Credit 2(2-0)**

This course is designed to study leadership and management theories and concepts in nursing and organizational behavior. The application of these theories and concepts to nursing practice and managing human resources in health care organizations are discussed. Management of the health care team and groups of clients will be emphasized.

NURS-516. Independent Study **Credit 3(3-0)**

An independent study on a specific topic or area in nursing to gain increased knowledge and/or skills enables the student to do research and/or practice in an area of interest in nursing under the guidance of the instructor.

NURS-518. Integration and Application of Nursing Practice **Credit 2(2-0)**

This course is designed for seniors to provide a systematic review of essential content necessary for the successful integration and application of nursing knowledge required for entry into nursing practice. Test-taking skills, along with anxiety reduction models, are incorporated throughout the content review. Emphasis is placed on providing individual, as well as group instruction to strengthen areas of weakness and enhance areas of strength. Students practice self evaluative skills and devise appropriate strategies based on outcomes from this evaluation process. Methods of instruction include lecture, discussion and computer assisted instruction.

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The Freshman Advisement and Learning Assistance Center

Sandra C. Alexander, Director

OBJECTIVES

The objectives of the Freshman Advisement and Learning Assistance Center are to provide an opportunity for underprepared students to: (1) achieve competence in communication skills during the freshman year in reading, writing, speaking and listening through a comprehensive, personalized instruction program. These students may advance at their own rate of speed through a carefully tailored series of educational experiences under the tutelage of their instructors; (2) achieve competence in computational skills during the freshman year in basic college mathematics through computational, and problem-solving experiences that are structured and monitored by faculty to insure skill development. Students will be permitted to work cooperatively and independently and proceed at their own rate until mastery of skills has been achieved and realized by the student. Students in the freshman class will be taught collectively and/or individually how to study and succeed in a college program. Basic concepts of studying will be taught, such as time management, how to study for examinations, how to organize and take notes, and the psychology of taking tests and passing them in various disciplines.

The Center is also responsible for coordinating the advisement program for freshman students and undecided students.

COURSES WITH DESCRIPTION IN FRESHMAN STUDIES

FRST-098. Basic Reading Skills

Credit 2

This course covers basic instruction in word recognition, word meanings, comprehension, analogies, and the principles of logical order.

FRST-099. Basic Writing Skills

Credit 3

This course covers basic instruction in the rudiments of grammar, sentence structure, mechanics, punctuation, outlining and paragraph development.

FRST-100. University Survival

Credit 1

This course provides an introduction to the University environment for freshman students; study skills, career exploration; University policies and procedures, critical thinking and University support services.

MATH-100. Intermediate Mathematics

Credit 3

This course provides elementary properties of real numbers and basic algebra through solving of quadratic equations by various means. Required of students whose mathematics SAT scores are low and whose major curriculum includes either MATH 101 or MATH 111.

CREDIT

Credit is given for all Learning Assistance Center courses taken. However, no quality points are received for Mathematics, Reading and English courses unless the Department Head approves the use of these courses as electives.

SPECIAL FEATURE

The Learning Assistance Center will accept, on a referral basis, any student who feels that he/she needs tutorial assistance in Mathematics and/or English. An instructor may also refer a student to the Center.

DIRECTORY OF FACULTY

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1995-97 Department of Military Science

Lt. Col. Robert L. Weeks, Professor

OBJECTIVE

The objective of the Army Reserve Officers' Training Corps (ROTC) is to train, motivate and prepare selected students with potential to serve as commissioned officers in the Regular Army, Army Reserve or the Army National Guard. The program is designed to provide an understanding of the fundamental concepts and principles of military art and science and to develop leadership and managerial potential in the student. A strong sense of personal integrity, honor, and individual responsibility, and an appreciation of the requirements for national security are instilled in all students. Attainment of these objectives will prepare students for commissioning and will establish a sound basis for their future professional development and effective performance in the Army or civilian life.

DEGREES OFFERED

Leads towards a Commission in the United States Army, Army Reserves or the National Guard.

GENERAL PROGRAM REQUIREMENTS

The ROTC program is divided into a basic course, which is normally taken during the freshman and sophomore years, and an advanced course, which is taken during the next two years. The admission of students to the ROTC program is based upon the general admission requirements of the University as they pertain to a full-time student.

DEPARTMENT REQUIREMENTS

The programs of instruction for Army ROTC include a four-year program and a two-year program. The four-year program consists of the two-year basic course, the two-year advanced course, and the Advanced ROTC Summer Camp. The two-year program encompasses a Basic ROTC Summer Camp, the two-year advanced course and the Advanced Summer Camp.

Basic Course: The basic course is designed to introduce the student to basic military concepts and the organization and mission of the U.S. Army. Those students who successfully complete this course are eligible to enter into the advanced course.

Credit for the basic course can be obtained by successfully completing Military Science 101, 102, 201, 202. A leadership laboratory must be taken concurrently each semester with the class. Prior service in the Armed Forces can be used to obtain appropriate credit for the basic course.

Advanced Course: The advanced course is designed to produce officers for the active Army as well as the Reserve Components. Entry into the advanced course is on a best qualified basis. The student must possess qualifications for becoming an effective Army officer. Applicants must attain and maintain a minimum G.P.A. of 2.0, (scholarship applicants must have a 2.5 G.P.A. and after being awarded the scholarship, must maintain a 2.0 G.P.A.) in order to validate their academic eligibility for participation in the program. The applicants must have a minimum of two years of academic work remaining at the educational institution in a curriculum leading to either a baccalaureate or advanced degree in a recognized academic field of study. In addition, each student must successfully complete an Advanced Summer Camp of at least six weeks. Applicants must also pass an Army medical examination. The following courses are required for completion of the advanced course: Military Science 301, 302, 401, 402. The leadership laboratory must also be taken each semester.

Two Year Program: This program is designed for junior college students or sophomores at four-year institutions who have not taken ROTC. A basic six-week summer training period after the sophomore year takes the place of the basic course required of students in the traditional four-year program. When a student with two years of college has successfully completed the basic summer training, he is eligible for the advanced ROTC course in his junior and senior years. The advanced course, which leads to an officer commission, is the same for students in either the four-year program or the two-year program.

CAREER OPPORTUNITIES

Successful completion of the ROTC program qualifies a student for a commission as a Second Lieutenant in one of the following branches of the Army: Adjutant General's Corps, Armor, Infantry, Military Police Corps, Ordnance Corps, Quartermaster Corps, Signal Corps, Medical Service Corps, Corps of Engineers, Finance Corps, Aviation, Field Artillery, Air

Defence Artillery, Transportation Corps and Army Nurse Corps. Special requirements and/or additional training is required for commissioning in the Medical Corps, Army Medical Specialist Corps, Veterinarian Corps, and the Judge Advocate General's Corps.

FINANCIAL AID

A subsistence fee of \$150.00 per month is paid to advanced course and scholarship cadets during the entire normal academic year while participating in Army ROTC. Four, three and two year scholarships are available. Details on scholarships are published by the Department of the Army and by the Military Science Department. In addition to the subsistence fee, the scholarship pays tuition, laboratory fees, book cost and certain supplies within the limits of the scholarship award.

COURSES WITH DESCRIPTION IN MILITARY SCIENCE

MISC-101. Introduction to Citizen/Soldier

Credit 1

An introduction to the mission, organization and history of the ROTC: Military and civilian obligation in relation to National Security; Individual Arms and Marksmanship Techniques, Emergency Medical Treatment. The students will receive information that will help them understand and prepare military correspondence (the Army Style of Writing). Leadership Laboratory training to include thorough indoctrination in military courtesy and customs of the service, drill experience, development of initiative and self-confidence.

MISC-102. Introduction to United States

Military Forces in Support of National Defense

Credit 1

A discussion of the mission and responsibilities of the United States Military Forces in support of National Security with emphasis on the role of the individual, participating citizen. Students will be introduced to Map Reading Techniques. Leadership Laboratory is a continuation of MS 101 Laboratory.

MISC-105/107. Leadership Laboratory * 205/207

Credit 1

Leadership Lab is in conjunction with each of the aforementioned M.S. level classes in the basic course. It is a period which supplements and reinforces, through practical application, the fundamentals taught in each of the Military Science classes. Leadership Lab is a progressive learning experience designed to produce effective and efficient Second Lieutenants for the United States Army.

MISC-201. Branches of the Army and Leadership Principles

Credit 1

A detailed study of the applicability of leadership principles, traits, and techniques in all job areas. Additionally, an appreciation is developed for leadership counseling techniques. The organization of the Army culminates this course.

MISC-202. Map Reading Skill Development and Military Ethics

Credit 1

A detailed study of orienteering to include basic fundamentals of map reading, grid systems, scale and distance, elevation and relief, military symbols, direction and location, and utilization of the declination diagram. Additionally, students will discuss the code of conduct, the principles of war and reinforce preparation of military correspondence. Leadership Laboratory is a continuation of MS 201 Laboratory.

MISC-301. Introduction to Military Team Theory

Credit 3

How to prepare and conduct military training, to include presentation and communication techniques. Included in this phase of instruction is a 10-minute oral presentation, how to cope with basic problems, i.e., discipline, motivation, encountered in small units, leadership training designed to further develop planning and organizational skills, fundamentals of offensive and defensive tactics, and principles of war.

MISC-302. Military Skill/Leadership Training**Credit 3**

A review of the principles and fundamentals of small unit tactics, and the application of the principles of offensive and defensive combat to units of the infantry battalion. Familiarization with characteristics, operation and employment of small unit weapons, communication systems and equipment, and continued development of selected Military Skills. Orientation relative to administrative procedures, required standards of performance, and general conduct of training at ROTC Advanced Summer Camp. Continuation of Leadership Laboratory Training conducted in MS 301.

MISC-305/307. Leadership Laboratory* 405/407.**Credit 1**

Leadership Lab is in conjunction with each of the aforementioned M.S. level classes in the advanced course. It is a period which supplements and reinforces, through practical application, the fundamentals taught in each of the Military Science classes. Leadership Lab is a progressive learning experience designed to produce effective and efficient Second Lieutenants for the United States Army.

MISC-401. Seminars in Leadership and Professional Development**Credit 3**

Leadership management and professional development, a study of the U.S. Army Personnel Management System, methods of conducting Command and Staff and Unit meetings, how to prepare military correspondence, ethics and professionalism, military justice.

MISC-402. Advanced Military Team Theory and Active Duty**Credit 3**

Management simulation exercise and Active Duty orientation, small unit effectiveness and Army Training Management, the U.S. Army logistics system, interpersonal skills, counseling techniques, and personnel evaluation, the Law and Principles of War, Code of Conduct and Geneva Convention, customs and courtesies of an Army officer.

MISC-206. Army ROTC Basic Camp+ (Internship Program)**Credit 4**

This course consists of 6 weeks of training at Fort Knox, KY. Training consists of Army History, Role and Mission, Map Reading/Land Navigation, Rifle Marksmanship, Basic Leadership Techniques, Physical Training/Marches, Individual and Unit Tactics, Communications, First Aid, Drill, Parades and Ceremonies, Military Courtesy, and Traditions. This course also teaches the student the ability to think and perform under pressure.

MISC-306. Army ROTC Advanced Camp+ (Internship)**Credit 4**

Normally taken the summer following the junior year. The training is conducted at designated, U.S. Army Installations. This training provides cadets with practical experience in leadership, Military Training, small unit tactics, weapons qualifications, and communications. This internship is six weeks in duration.

MISC-406. Airborne Training+ (Internship)**Credit 3**

This course consists of 3 weeks of intensive airborne training to include physical conditioning, landing techniques, parachute safety, simulated jumps, procedure in and around aircraft, and five (5) combat jumps from Air Force aircraft flying at 1250 feet.

**Denotes subject that must be taken every semester.*

+Optional training on a selected basis.

DIRECTORY OF FACULTY

Clinton Bowman, Jr., CPT, EN, B.A., Central State University, Assistant Professor

Thomas R. Covington CPT., TC, B.S., North Carolina A&T State University; Assistant Professor

Antonio W. Foster, CPT., QM, B.S., North Carolina A&T State University; Assistant Professor

Gloria E. Davis, MAJ., AG, B.S., Morgan State; M.S., Coppin State; Assistant Professor

Department of Aerospace Studies

Lt. Col. Ronald K. Murphy, Professor

OBJECTIVE

The United States Air Force maintains a permanent Air Force Reserve Officer Training Corps at this institution for the purpose of conducting both leadership and military training. The specific objective is to conduct a modern academic program keyed to the development of the professional officer. This program is offered in two divisions. The lower division for freshmen and sophomores is called the General Military Course. The upper division, established as the Professional Officer Course, is designed to continue the training of juniors and seniors, providing a complete four-year officer preparatory program. The entire Aerospace Studies curriculum is designed to commission quality young men and women who are not only educated in the academics of their university, but who have a competency in certain military skills and a strong motivation for active duty and an Air Force career.

PROGRAM OF INSTRUCTION

General Military Course (GMC). This course is open to freshmen and sophomores and is designed to provide the student with a basic foundation in the history and development of air power and the organization and mission of the U.S. Air Force. After completion of the General Military Course, continuation to Field Training and Professional Officers Course (POC) is not automatic. Selection for entry to Field Training and the Professional Officer Course is competitive in nature. Applicants must attain certain minimum scores on both the Air Force Officer Qualifying Test (AFOQT) and the Weighted POC Selection System (WPSS). WPSS is a selection system that uses a number of weighted factors. Included in these factors are cumulative grade point average, physical fitness test score, AFOQT scores and Unit Commander's Rating (UCR). Applicants must also pass an Air Force medical examination. WPSS applies to two-year and four-year applicants.

Field Training. AFROTC Field Training is offered during the summer months at selected Air Force bases throughout the United States. Students in the four-year program participate in four weeks of Field Training during the summer, usually between their sophomore and junior year. The major areas of study in the four-week Field Training program include junior officer training, aircraft and aircrew orientation, career orientation, survival training, Air Force environment, and physical fitness training.

Students applying for entry into the two-year program must successfully complete six weeks of Field Training prior to enrollment in the POC. Application for the two-year program must be made during the Fall (or early Spring) semester of the sophomore year. The major areas of study included in the six week Field Training program are essentially the same as those conducted at four-week Field Training and in the General Military Course.

Professional Officer Course (POC). The POC first year is a study of management and leadership. The final year deals with the formulation and implementation of American defense policy and the military law system.

Leadership Laboratory. Leadership Laboratory is taken an average of one and one half hours per week throughout the student's four years of enrollment in AFROTC. Two-year program students participate while in the Professional Officer Course. Instruction is con-

ducted within the framework of an organized cadet corps with a progression of experiences designed to develop each student's leadership potential and management skills. Leadership Laboratory involves a study of Air Force customs and courtesies; drill and ceremonies; career opportunities in the Air Force; and the life and work of an Air Force junior officer. Students develop their leadership potential and management skills in a practical supervised laboratory, which typically includes field trips to Air Force installations throughout the U.S.

UNIFORMS AND EQUIPMENT

All regularly enrolled cadets of Air Force ROTC are furnished cost-free textbooks. A deposit of fifteen dollars (\$15.00) is required of all cadets when they are issued a uniform. The fee will be refunded upon return of all items issued, with the exception of a nominal cleaning fee. Each cadet is responsible for the maintenance and security of property. All property issued must be returned at the end of the normal school year or upon withdrawal from school.

TRANSFER CREDIT

Transfer credit is permitted for cadets entering Air Force ROTC from another advanced ROTC program (Air Force, Army or Navy) at any college, university or academy.

FINANCIAL AID

A subsistence fee of \$150.00 per month is paid to advanced cadets (juniors and seniors) during the entire normal academic year while a member of Air Force ROTC.

Scholarships may be granted for periods of two, three, and four years. Details on scholarships will be published by the Department of the Air Force and by the Department of Aerospace Studies, N.C. A&T State University. All students on scholarship receive \$150.00 per month tax-free allowance and the Air Force pays tuition, laboratory fees and a book allowance. In addition, the University will provide room and board for four year scholarship recipients.

STRUCTURE OF THE CADET GROUP

The Air Force ROTC Cadet Group, commanded by a cadet lieutenant colonel, consists of two squadrons. Within the structure of the group are such special functions as: the cadet drill team and Arnold Air Society.

SPECIAL HONORS

Outstanding performance in the Air Force ROTC program is recognized by award of special honors, including distinguished graduate. Other honors are the Athletic Achievement and the Superior Performer Awards, presented for outstanding performance during field training.

CADET WELFARE FUND

All AFROTC cadets are members of the Cadet Welfare Fund. A voluntary membership fee of \$10.00 is requested at initial session each semester. These fees are used to defray expenses for various cadet social activities.

AIR FORCE ROTC PROFESSIONAL OFFICER CORPS (POC)

The Cadet Professional Officers Corps provides advanced cadets with an opportunity to demonstrate organizational leadership abilities and to promote social and cultural activities. The Cadet Professional Officer Corps provides advanced cadets the opportunity to practice organizational and leadership abilities. Cadets are responsible for planning and conducting

a variety of community service, cultural and social activities. Each advanced cadet is requested to contribute to the Professional Officer Corps Fund. The amount of the contribution will be determined by POC members each school year. The dues are used to defray expenses for various cadet community service and social activities.

COURSES WITH DESCRIPTION IN AEROSPACE STUDIES

AERO-101. The U.S. Air Force Today I

Credit 1(1-0)

This course introduces the Air Force to the student. It includes the study of Air Force doctrine, mission, and organization; U.S. Strategic Offensive and Defensive Forces, their mission and function. To be offered in the Fall semester.

AERO-102. Leadership Laboratory

Credit 0(0-1)

This course provides the student with a knowledge of basic drill and ceremonies; the correct wear of the Air Force uniform; customs and courtesies; the environment of an Air Force base; and the benefits, opportunities, privileges and responsibilities associated with an Air Force commission. Must be taken in conjunction with AERO 101.

AERO-103. The US Air Force Today II

Credit 1(1-0)

This course adds to the student's understanding of Air Force commands; U.S. General purpose and Aerospace support forces; and gives special attention to geography relative to U.S. national security and defense policy and strategy. To be offered in the Spring semester.

AERO-104. Leadership Laboratory

Credit 0(0-1)

This course is a continuation of AERO 102. The student learns more about giving military commands, instructing, correcting and evaluating the skills taught in AERO 102. More detailed information is provided about the Air Force environment and the career opportunities that are available. Must be taken in conjunction with AERO 103.

AERO-201. The Development of Air Power I

Credit 1(1-0)

This course focuses on the development of air power from balloons and dirigibles through two World Wars and the jet age, the evolution of air power concepts and doctrine; the role of technology in the growth of air power technology; and an assessment of oral communicative skills. To be offered in the Fall semester.

AERO-202. Leadership Laboratory

Credit 0(0-1)

This course studies Air Force customs and courtesies; drill and ceremonies; Air Force environment; and the life and work of an Air Force junior officer. Must be taken in conjunction with AERO 201.

AERO-203. The Development of Air Power II

Credit 1(1-0)

This course traces the history of the U.S. Air Force from its beginning as a separate service in 1947 through the Bush administration. It surveys the period of the cold war after WW II; role of U.S. air power in the Vietnam conflict and Desert Storm; and briefly surveys the aerospace future. An assessment of written communicative skills is performed. To be offered in the Spring semester.

AERO-204. Leadership Laboratory

Credit 0(0-1)

This course continues the study of Air Force customs and courtesies; drill and ceremonies; Air Force environment and the life and work of an Air Force junior officer. Field Training Orientation is also provided. Must be taken in conjunction with AERO 203.

PROFESSIONAL OFFICER COURSE

Juniors

AERO-401. The Professional Officer I

Credit 3(3-0)

An integrated management course emphasizing the role and function of a manager. Encompasses management as it has developed through recorded history and also the social and physical setting of a manager in an Air Force environment. Individual motivation and behavioral processes, communication, and group dynamics are covered to provide a foundation for the development of the junior officer's professional skills. The basic management process involving decision-making, planning, organizing, directing, and controlling are emphasized. Attention is focused on the progressive development of communication skills needed by junior officers. To be offered in the Fall semester.

AERO-402. Leadership Laboratory

Credit 0(0-1)

Allows the student to apply leadership and management principles through participation in advanced leadership experiences. This involves organizing, and conducting drill and ceremony functions; preparing and presenting group briefings; and evaluating the performance of GMC cadets. Must be taken in conjunction with AERO 301.

AERO-403. The Professional Officer II

Credit 3(3-0)

A study of leadership theory and its application to real-world problems. Prepares the student for adjusting to a rapidly changing world without difficulty. Focuses on the broader aspects of management, on personal and social values and the place that management takes in molding a better environment. An overview of the details of what managers should do with emphasis on the leadership roles of Air Force officers. To be offered Spring semester.

AERO-404. Leadership Laboratory

Credit 0(0-1)

A continuation of AERO 302. The student continues to develop personal leadership and management competencies through participation in advanced leadership experiences. The student will also be involved in the planning and conducting of several special projects and events including the Military Ball and the Cadet Corps Dining-In. Must be taken in conjunction with AERO 303.

AERO-501. National Security Forces in Contemporary

American Society I

Credit 3(3-0)

This course conceptually focuses on the Armed Forces as an integral element of society with emphasis on the broad range of American Civil-Military relations and the environmental context in which defense policy is formulated and implemented. Special themes include: the role of the professional military leaders—managers in a democratic society; the fundamental values and socialization processes associated with the Armed Services; the requisites for maintaining adequate national security forces; political, economic, and social constraints on national security. The student will be aware of the importance of technological and international developments have on national defense. Students prepare oral and written presentations to supplement class discussions, seminars, and conferences. To be offered Fall semester.

AERO-502. Leadership Laboratory

Credit 0(0-1)

This laboratory is an integral and mandatory portion of the Aerospace Studies curriculum. It is designed to develop each student's leadership potential and serve as an orientation to Active Duty. Students are involved in the planning, organizing, coordinating, directing, and controlling of military activities in the Cadet Corps. Must be taken in conjunction with AERO 401.

AERO-503. National Security Forces in Contemporary

American Society II

Credit 3(3-0)

This course is a continuation of AERO 401. The student uses the analytical skills gained in AERO 401 to predict the outcome of world situations. Students are given the opportunity to

apply listening, speaking, and writing skills in typical military situations with accuracy, clarity, and appropriate style. National and international determinants and constraints relating to the use of national power are discussed. The student should comprehend selected provisions of the military justice system as they relate to responsibilities of the military officer.

AERO-504. Leadership Laboratory **Credit 0(0-1)**

This laboratory is a continuation of AERO 402. It provides the students with practical command and staff leadership experiences through their performance of various tasks within the framework of an organized Cadet Corps. This lab is further designed to provide the students with information which will facilitate a smooth transition from civilian status to Air Force life. Must be taken in conjunction with AERO 403.

DIRECTORY OF FACULTY

LTC Ronald K. Murphy, B.S., North Carolina A&T State University; M.S., University of Philippines; Professor

Major Robert B. Clark, III, B.S., North Carolina A&T State University; M.B.A., Southern Illinois University; Assistant Professor

Captain Keith A. Caver, B.S., Park College; M.S., Air Force Institute of Technology; Assistant Professor

Waste Management Institute

Godfrey A. Uzochukwu, Director

The Waste Management Institute (WMI) coordinates the interdisciplinary environmental and waste management efforts of the University in the areas of instruction, research, and community outreach. The approach to environmental and waste management education at the University rests upon a solid foundation of applied and social sciences, engineering, technology, and law/policy. The following academic units are involved in environmental and waste management activities: Animal Science; Agricultural Education; Agricultural Economics; Architectural Engineering; Biology; Business Administration; Chemical Engineering; Civil Engineering; Computer Science; Curriculum and Instruction; Construction Management and Safety; Economics; Electrical Engineering; History; Human Environment and Family Science; Industrial Engineering; Mechanical Engineering, Natural Resources; Nursing; Physics; Psychology and Sociology/Social Work.

Additionally, the Waste Management Institute administers an Undergraduate Certificate Program and offers a Concentration in Waste Management. Interested students are required to complete 18-20 hours of approved environmental and waste management courses. The Waste Management Certificate Program complements the student's academic major and enhances the value of the degree.

REQUIREMENTS FOR THE WASTE MANAGEMENT CERTIFICATE/CONCENTRATION (18-20) CREDIT HOURS):

EASC 201; EASC 444; EASC 622; EASC 699; AREN 221; AREN 573; CIEN 310; CIEN 311; CIEN 410; CIEN 416; CIEN 610; CIEN 618; INEN 664; PHYS 407; HIST 307; CHEM 641; LDAR 203; CROS 603; HEFS 643; ANSC 637; LASC 462; CM 593; OSH 311; OSH 312; OSH 411; OSH 413; OSH 414; OSH 415; OSH 416; OSH 515; OSH 516; OSH 517; AGED 607; ENVIRONMENTAL INTERNSHIP AND SPECIAL TOPIC/PROBLEM COURSES; ENGINEERING DESIGN COURSES; CONSORTIUM COURSES IN LAW/POLICY THAT ARE RELATED TO ENVIRONMENTAL AND WASTE MANAGEMENT. Note that the above courses do not include prerequisites and must be approved by Academic Advisors and the Director of Waste Management Institute. The Waste Management Institute is located in the Carver Hall Annex.

THE GRADUATE SCHOOL

Meada Gibbs, Dean

Graduate education at North Carolina Agricultural and Technical State University was authorized by the North Carolina State Legislature in 1939. The authorization provided for graduate training in agriculture, applied science and allied areas of study. An extension of the graduate program, approved by the General Assembly of North Carolina in 1957, provided for enlargement of the program to include teacher education as well as such other programs of a professional or occupational nature as might be approved by the State Board of Higher Education.

OBJECTIVES OF THE GRADUATE SCHOOL

The Graduate School of North Carolina Agricultural and Technical State University offers advanced study for qualified individuals who wish to improve their competence for careers in professions related to agriculture, animal science, applied science, computer science, education, engineering, science research, technology, the humanities and the social sciences. Such study of information and techniques is provided through courses of study leading to the Master of Science and Doctor of Philosophy degrees and through institutes, workshops, and individual courses designed for those who are not candidates for a higher degree but who desire advanced work in certain fields of study. Second, the School of Graduate Studies provides the foundation of knowledge and of techniques required for those who wish to continue their education in doctoral programs at other institutions. Third, the Graduate School assumes the responsibility of stimulating and encouraging scholarly research among students and faculty members.

It is expected that, in the course of their studies, graduate students (1) will have acquired special competence in at least one field of knowledge; (2) will have developed further their ability to think independently and constructively; and (3) will have developed and demonstrated the ability to collect, organize, evaluate, and report facts which will enable them to make a contribution in their field of study.

DEGREES GRANTED

The School of Graduate Studies of North Carolina A&T State University offers the following degrees:

DOCTOR OF PHILOSOPHY

1. Electrical Engineering
2. Mechanical Engineering

MASTER OF ARTS

English and Afro-American Literature

MASTER OF SCIENCE

1. Agricultural Education
 - A. Agricultural Marketing
 - B. Production Economics
 - C. Rural Development
2. Agricultural Education
3. Animal Health Science
4. Applied Mathematics
5. Biology
6. Chemistry
7. Computer Science
8. Education
 - A. Administration
 - B. Adult Education
 - C. Educational Media
 - D. Elementary Education
 - E. Secondary Education
 1. Art
 2. Biology
 3. Chemistry
 4. English
 5. History
 6. Mathematics
 7. Health and Physical Education
 8. Reading
 9. Social Science
 - F. Guidance
 1. Counselor Education
 2. Human Resource (Agency Counseling)
 3. Human Resource (Business and Industry)
9. Architectural Engineering
10. Electrical Engineering
11. Engineering
12. Industrial Engineering

13. Mechanical Engineering
14. Plant and Soil Science
15. Food and Nutrition
16. French
17. Technology Education
 - A. Technology Education
 - B. Vocational Industrial Education
18. Industrial Technology

ADMISSION TO GRADUATE SCHOOL

ADMISSION TO MASTER'S DEGREE PROGRAMS

Applicants to the Master's degree program for graduate study must have earned a bachelor's degree from a four-year college. Application forms must be submitted to the Graduate School Office with two transcripts of previous undergraduate and graduate studies. Applicants may be admitted to graduate studies unconditionally, provisionally, or as special students. Applicants are admitted without discrimination because of race, color, creed, or sex.

Unconditional Admission

To qualify for unconditional admission to the master's degree program for graduate study, an applicant must have earned an over-all average of 2.6 on a 4 point system (or 1.6 on a 3 point system) in his/her undergraduate studies. Some programs require a 3.0 grade point average on a 4.0 scale; therefore, applicants should check appropriate sections of the *Graduate Bulletin* to ascertain the minimum grade point average required. In addition, a student seeking a degree in Agricultural Education, Elementary Education, Industrial Education, or Secondary Education must possess, or be qualified to possess, a Class A Teaching Certificate in the area in which he/she wishes to concentrate his/her graduate studies. A student seeking a degree with a concentration in Administration or Guidance must possess, or be qualified to possess, a Class A Teaching Certificate. See certification except for Vocational-Industrial Education (post secondary/private industry).

Provisional Admission

An applicant may be admitted to the master's degree program for graduate study on a provisional basis if (1) he/she earned his/her baccalaureate degree from a non-accredited institution or (2) the record of his/her undergraduate preparation reveals deficiencies that can be removed near the beginning of his/her graduate study. A student admitted provisionally may be required to pass examinations to demonstrate his/her knowledge in specified areas, to take specified undergraduate courses to improve his/her background, or to demonstrate his/her competence for graduate work by earning no grades below "B" in his/her first nine hours of graduate work at this institution.

Special Students

Students not seeking a master's degree at A&T may be admitted in order to take courses for self-improvement or for renewal of teaching certificate if said students meet standard School of Graduate Studies entrance requirements. If a student subsequently wishes to pursue a degree program, he/she must request an evaluation of his/her record. The School of Graduate Studies reserves the right to refuse to accept towards a degree program credits which the candidate earned while enrolled as a special student; in no circumstances may the student apply towards a degree program more than twelve semester hours earned as a special student.

ADMISSION TO DOCTORAL PROGRAMS

Applicants to the **Doctor of Philosophy (Ph.D.) program in Electrical Engineering** must have a master's degree in Electrical Engineering, Computer Engineering, or related disciplines, possess an earned grade point average of 3.5, present scores of 70, 80, and 70 percentiles on the verbal, quantitative, and analytical portions of the Graduate Record Examination respectively, present three letters of recommendations, and present TOEFL scores of 550.

There is no provisional admission to the Ph.D. program; however, a student who satisfies all but the first requirement above may be admitted to the master's program with the understanding that admission to the Ph.D. program may be granted upon completing additional work. Applications may be received from students holding the bachelor's degree, but they will initially be admitted to the master's degree program.

To be considered for admission to the **Ph.D. program in Mechanical Engineering**, an applicant must have a baccalaureate degree from a college or university recognized as standard by a regional or general accrediting agency and must have at least a 3.5 grade point average in the appropriate Master of Science program. Applicants should see the specific program sections of the *Graduate Bulletin* for more details about admission requirements to Electrical and Mechanical Engineering.

FACULTY EMERITI

J. Niel Armstrong, Education B.S., A. and T. College; A.M., University of Michigan.
W. Archie Blount, Education B.S., A. and T. College; M.S., Ed.D., Pennsylvania State University.
Pearl G. Bradley, Speech B.S., A. and T. College; A.M., University of Michigan; Ph.D., Ohio State University.
Carolyn C. Crawford, Home Economics B.S., M.A., Columbia University.
C.R.A. Cunningham, Biology B.S., M.S., University of Illinois.
Ann Davis, Home Economics B.S., A. and T. College; Columbia University.
Mable M. Dillard, English B.S., M.A., Ph.D., Ohio University.
Donald A. Edwards, Physics A.B., Talladega College; M.S., University of Chicago; Ph.D., University of Pittsburgh.
Clara V. Evans, Home Economics B.S., West Virginia State College; M.A., Columbia University.
E. Bernice Johnson, Home Economics B.S., M.S., North Carolina College.
Wadaran L. Kennedy, Animal Husbandry B.S., M.S., University of Illinois; Ph.D., Pennsylvania State College.
John C. McLaughlin, Economics and Rural Sociology B.S., A. and T. College; M.S., Cornell University.
Samuel C. Smith, Industrial Education B.S., A. and T. College; M.S., University of Michigan.
Glenn F. Rankin, Agricultural Education B.S., A. and T. College; M.S., Ed.D., Pennsylvania State University.
Armand Richardson, Electrical Engineering B.S.E.E., M.S.E.E., University of Pittsburgh.
Arthur Totten, Animal Science B.S., West Virginia State College; M.S., Michigan State University.
Frank H. White, History B.S., Hampton Institute; M.A., Ph.D., Ohio State University.
Naomi W. Wynn, Nursing R.N., Hampton Institute School of Nursing; B.S., M.A., New York University.

DIRECTORY OF FACULTY - F.D. BLUFORD LIBRARY

Library Faculty

John Akonful, B.A., Johnson C. Smith University; M.S.L.S., Atlanta University; Assistant Professor

Evelyn Blount, B.S., M.L.S., North Carolina Central University; Assistant Professor

Arneice Bowen, B.A., Meredith College; M.L.S., N.C. Central University; Assistant Professor

Waltrene Canada, B.S., N.C. A&T State University; M.L.S., N.C. Central University; Assistant Professor

Rebecca Floyd, B.A., M.S.L.S., University of North Carolina at Chapel Hill; Assistant Professor

Gwen Harris, B.A., Winston-Salem State University; M.L.S., University of North Carolina at Greensboro; Assistant Professor

MoonOk Kim, B.A., Sook Myong Women's University, Seoul, Korea; M.L.S., Emory University; Assistant Professor

Inez Lyons, B.S., North Carolina A&T State University; M.L.S., North Carolina Central University; Assistant Professor

Doris Mitchell, B.S., M.S.L.S., Rutgers University; Associate Professor

Euthena Newman, B.A., South Carolina State College; M.L.S., University of North Carolina at Greensboro; Assistant Professor

Saundra Peterson, B.A., Spellman College; M.L.S., George Peabody College of Vanderbilt University; Assistant Professor

Gloria Pitts, B.A., Howard University; M.L.S., University of North Carolina at Greensboro; Instructor

John Teleha, B.S., Case Western Reserve University; M.S. L.S., Kent State University; Assistant Professor

Jean F. Williams, B.S., North Carolina Central University; M.S.L.S., Atlanta University; Assistant Professor

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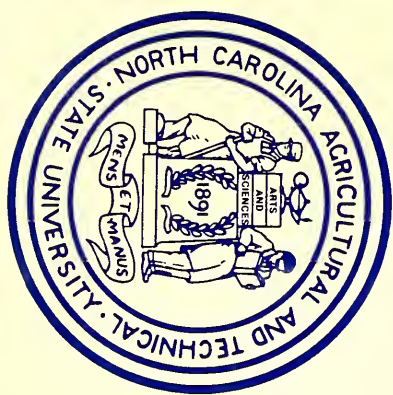
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